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Final
February 1989

Environmental Impact Statement
JAMES CREEK COAL
Preference Right Lease Application

U.S. Department of the Interior
Bureau of Land Management
Craig District, Colorado

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March 3, 1849

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE
2850 YOUNGFIELD STREET
LAKEWOOD, COLORADO 80215-7076

TAKE PRIDE IN AMERICA

February 9, 1989

Dear Reader:

Enclosed for your review is the Final Environmental Impact Statement (EIS) for the James Creek Coal Preference Right Lease Application. This Final EIS also serves as a proposed plan amendment for the White River Resource Area Management Framework Plan.

This Final EIS contains an updated analysis which corrects and clarifies the analysis presented in the Draft EIS. It also contains public comments on the Draft EIS and BLM's responses to those comments.

The proposed land use planning decisions may be protested. Protests should be sent to:

Director (760)
Bureau of Land Management
Premier Building, Room 909
1725 I Street, N.W.
Washington, D.C. 20240

Protests must be sent within 30 days of the date of publication of the Notice of Availability by the U.S. Environmental Protection Agency in the Federal Register. Protests should include the following information:

1. The name, mailing address, telephone number, and interest of the person filing the protest;
2. A statement of the issue or issues being protested;
3. A statement of the part or parts being protested;
4. A copy of all documents addressing the issue or issues that were submitted during the planning process by the protesting party, or an indication of the date the issue or issues were discussed for public records; and
5. A concise statement explaining why the proposed decision is believed to be wrong.

After a 30-day protest period and Governor's Consistency Review, the BLM Colorado State Director will approve the plan excluding any portion under protest. After any protests are resolved, a record of decision, outlining the Amendment to the White River Resource Area Management Framework Plan, will be published.

We would like to thank the agencies, organizations, and individuals whose participation, comments, and suggestions have helped us to prepare a plan that will lead to more effective management of the public lands. Your interest is appreciated.

Sincerely,

Neil F. Morck
State Director

JAMES CREEK COAL PREFERENCE RIGHT LEASE APPLICATION

DRAFT( )FINAL(X)

The United States Department of the Interior, Bureau of Land Management, in cooperation with the Office of Surface Mining Reclamation and Enforcement (OSMRE) and the U. S. Fish and Wildlife Service.

Type of Action: Administrative(X) Legislative( )

Abstract: This Final Environmental Impact Statement (FEIS) describes and analyzes the site-specific and cumulative environmental impacts of the proposed leasing of Preference Right Lease Application (PRLA) C-0126998 located about 9 miles northeast of Meeker, Colorado, in Rio Blanco County, and in the Craig District, Bureau of Land Management (BLM).

This PRLA, which covers 5,100 acres, is held by Consolidation Coal Company (Consol). Consol has identified a 10-million-ton-per-year surface mining scenario in conjunction with an adjacent Federal lease, as the likely development of the PRLA, should the lease be issued. It is around this scenario, which includes a mitigation and reclamation plan, that the analysis is centered.

The PRLA and lease are partially overlain by the Colorado Division of Wildlife's Jensen State Wildlife Area. Because of this, the Colorado Division of Wildlife has participated in the analysis. The two main issues analyzed in the document are local hydrology and wildlife, primarily elk. Although impacts to elk can be mitigated, to an insignificant level, impacts to hydrology remain. Some economic impacts may occur with or without leasing and development of the PRLA.

The Alternatives considered in this EIS include:

No Action
Withdrawal/Just Compensation
Lease Exchange
Proposed Action (Consol's Current Proposal)
BLM's Preferred Alternative

The alternatives analyzed reflect the alternatives before BLM at this time. If a lease is issued, no development could occur prior to completion of the permitting process. This would be initiated at a later date and be under the jurisdiction of OSMRE. Additional environmental analyses will be prepared at that time if necessary.

This analysis also serves as a plan amendment to the White River Resource Area Management Framwork Plan for the project area. As such, some of the proposed decisions may be protested, and there is a 30 day protest period.

For further information on this EIS, contact:

Greg Goodenow, Project Manager
Bureau of Land Management
Craig District Office
455 Emerson Street
Craig, Colorado 81625
Telephone: (303) 824-8261

JAMES CREEK COAL
PREFERENCE RIGHT LEASE APPLICATION

FINAL ENVIRONMENTAL IMPACT STATEMENT
AND AMENDMENT TO
WHITE RIVER RESOURCE AREA
MANAGEMENT FRAMEWORK PLAN

PREPARED BY:

CRAIG DISTRICT, COLORADO
BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR

COOPERATING AGENCIES:

OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT

U.S. FISH AND WILDLIFE SERVICE

NEIL MORCK
STATE DIRECTOR
COLORADO STATE OFFICE

SUMMARY

This enviromental impact statement (EIS) describes and analyzes the environmental impacts of leasing a coal Preference Right Lease Application (PRLA) located about 9 miles northeast of Meeker, Colorado, in Rio Blanco County. It also documents a BLM land use planning decision for the PRLA and an adjacent Federal coal lease. This PRLA (C-0126998) lies in the Bureau of Land Management's (BLM) White River Resource Area of the Craig District, Colorado. The possible development would include portions of the PRLA and an adjacent Federal lease (C-093713). (This development area is referred to as the project area throughout this document.)

About 85 percent of the PRLA surface estate is non-federally owned. Of this, about 2,250 acres are part of the Jensen State Wildlife Area, owned by the Colorado Division of Wildlife. The rest of the non-federally owned surface estate is held by private individuals. The Federal government owns all mineral rights in the project area.

The PRLA covers 5,099.31 acres, with elevations ranging from 6,640 to 8,673 feet. Narrow valleys and hills with steep slopes characterize the area. Land uses include 5,081 acres for rangeland, 15 acres for agricultural land and about 3 acres for residences.

Consolidation Coal Company (Consol) has identified a scenario for mining portions of the PRLA and an adjacent Federal lease. The total area to be disturbed would be about 5,200 acres over 30 years. This includes actual mining and permanent facilities, shops, bathhouse, and other facilities. The mine would produce 10 million tons of coal per year during full production and 280 million tons over the life of the mine. Approximately 2/3 of the production or 190 million tons would come from the PRLA.

Because elk use throughout the project area is extensive and much of the area is owned by the Colorado Division of Wildlife (CDOW), Consol has designed comprehensive mitigation into the mining scenario. In the opinion of the BLM and CDOW, mitigation currently proposed in BLM's preferred alternative and others mitigation that may be identified through the mine permitting process should reduce the impacts to elk to an insignificant level.

Through public meetings and BLM's preliminary analysis, resources and areas of concern were identified for inclusion in this EIS.

Alternatives considered in this EIS include:

- No Action
- Withdrawal/Just Compensation
- Lease Exchange
- Proposed Action (Consol's Current Proposal)
- BLM's Preferred Alternative

The alternatives analyzed reflect the alternatives before BLM at this time. If a lease is issued, no development could occur prior to completion of the permitting process. This would be initiated at a later date and be under the jurisdiction of OSMRE. Additional environmental analysis will be prepared at that time if necessary.

There is very little difference between Consol's proposed action and BLM's preferred alternative because of resolution of conflicts among Consol, BLM, and CDOW. Consol has altered its original scenario to incorporate wildlife and environmental concerns, raised by both agencies.

The conclusion of the analysis in this EIS is that significant impacts to elk could be avoided through the protective measures agreed to by Consol. Additional measures identified by BLM in the Preferred Alternative would reduce the probability of impacts even more, as shown in table S-1.

Permitted production for northwest Colorado (about 29 million tons per year) exceeds actual demand and actual production (about 11.4 million tons per year in 1987). Coal now under lease exceeds permitted production levels and projected production levels of 16-20 million tons per year by the year 2000.

Leasing and development of this PRLA will not affect coal production in northwest Colorado. Simply stated, the market and resultant production will be about the same (16-20 million tons), with or without Consol's development. If Consol gets the lease and subsequently develops the area, they will capture a share of the market and will contribute to regional impacts. If they do not develop the project, regional production will be unaffected, and the level of regional impacts such as employment, encroachment on wildlife habitat, increased population, etc., will not be affected.

TABLE S-1
COMPARATIVE ANALYSIS OF IMPACTS ASSOCIATED WITH THE ALTERNATIVES

Resource	No Action/No Development Alternatives	Consol's Proposed Plan	BLM's Preferred Alternative
Wildlife	No impacts	Alteration of water source, displacement or disturbance of up to 300 elk on and in the vicinity of the PRLA (mitiagated to an insignificant level)	Alteration of water source, displacement or disturbance of up to 300 elk on and in the vicinity of the PRLA (mitigated to an insignificant level)
Threatened & Endangered Fish Species	No contribution to cummulative impacts from this project.	Any adverse impacts would be offset with conservation measures applied during the permitting process.	Any adverse impacts would be offset with conservation measures initiated at lease issuance.
Soils	No impacts	Alteration of natural soil system (not significant)	Alteration of natural soil system productivity protected (not significant)
Geology & Minerals	No impacts	Development of 280 million tons of coal	Development of 280 million tons of coal
Surface Water	No impacts - TDS* of 800 mg/l**	Potentially significant alteration of quantity & TDS of 2,000-3,900 mg/l	Potentially significant alteration of quantity& TDS of 2,000-3,900 mg/l
Groundwater	No impacts - TDS* of 800 mg/l**	Potentially significant alteration of quantity & TDS of 2,000-3,900 mg/l	Potentially significant alteration of quantity & TDS of 2,000-3,900 mg/l
Alluvial Valley Floor	No impacts	No significant impact anticipated	No significant impact anticipated
Vegetation	No impacts	Possible long term loss of wetlands and meadows - about 152 acres of disturbance due to the rail line - not regionally significant	Possible long term loss of wetlands and meadows - about 152 acres of disturbance due to the rail line - not regionally significant
Cultural Resources	No impacts	Potential loss of undiscovered sites (unknown significance)	Potential loss of undiscovered sites reduced (unknown significance)
Paleontological	No impacts	No known significant impacts, but potential exists	No known significant impacts, potential for impact reduced
Land Use/Grazing	No impacts	Loss of short-term forage - not regionally significant, major change in one ranching operation	Loss of short-term forage - not regionally significant, major change in one ranching operation
Jensen State Wildlife Area	No impacts	About 2,200 acres disturbed/reclaimed. Not significant with mitigation	About 2,200 acres disturbed/reclaimed. Not significant with mitigation.
Recreation and Visual	No impacts	Loss of recreational opportunites and quality of the setting (not regionally significant)	Loss of quality of the setting (not regionally significant)
Social/Economic	Possible increased population in Meeker and Craig, significant impacts	Possible increased population, no significant impacts above No Action/No Devleopment	Possible increased population, no significant impacts above No Action/No Development
Other Resources: Air Quality, Climate, Wilderness, Threatened and Endangered Avian, Terrestrial, or Plant species, Land Use Rights-of-Way & Leases, Noise, and Transportation	No impacts	No significant impacts	No significant impacts

* Total dissolved solids

** Miligrams per liter

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CHAPTER ONE

INTRODUCTION

CHAPTER 1—INTRODUCTION

PURPOSE AND NEED

This Preference Right Lease Application (PRLA) C-0126998 is held by Consolidation Coal Company (Consol) (Map 1-1). As required by regulations pertaining to federally owned coal (43 CFR 3400), the Bureau of Land Management (BLM) is processing this PRLA (considering issuing a lease to Consol). This Environmental Impact Statement (EIS) discusses the impacts of various leasing alternatives. (A decision to issue a lease would not in and of itself authorize any surface disturbance.) In order to identify potential lease stipulations to be included in the leasing alternatives, and compare and contrast the impacts of leasing decisions, development scenarios have been included in the analysis.

Comments on the Draft EIS indicated a confusion between the leasing and permitting (development) process. While the Bureau of Land Management hopes that analysis contained in this document will be useful during the permitting process (jurisdiction for permitting lies with the Office of Surface Mining Reclamation and Enforcement, and the Colorado Mined Land Reclamation Division), this analysis serves only to identify the impacts of the several leasing alternatives. Figure 1-1 outlines the PRLA. Additional analysis will be performed by the appropriate agency during the permitting process, after actual development is proposed.

This EIS complies with the National Environmental Policy Act and documents a land-use plan amendment, as required in order to process the PRLA. Consol has identified a 10-million-ton-per-year surface mine scenario. The analysis in this EIS considers Consol's scenario for ultimate development of the area should a lease be issued.

PREFERENCE RIGHT LEASE APPLICATION PROCESSING

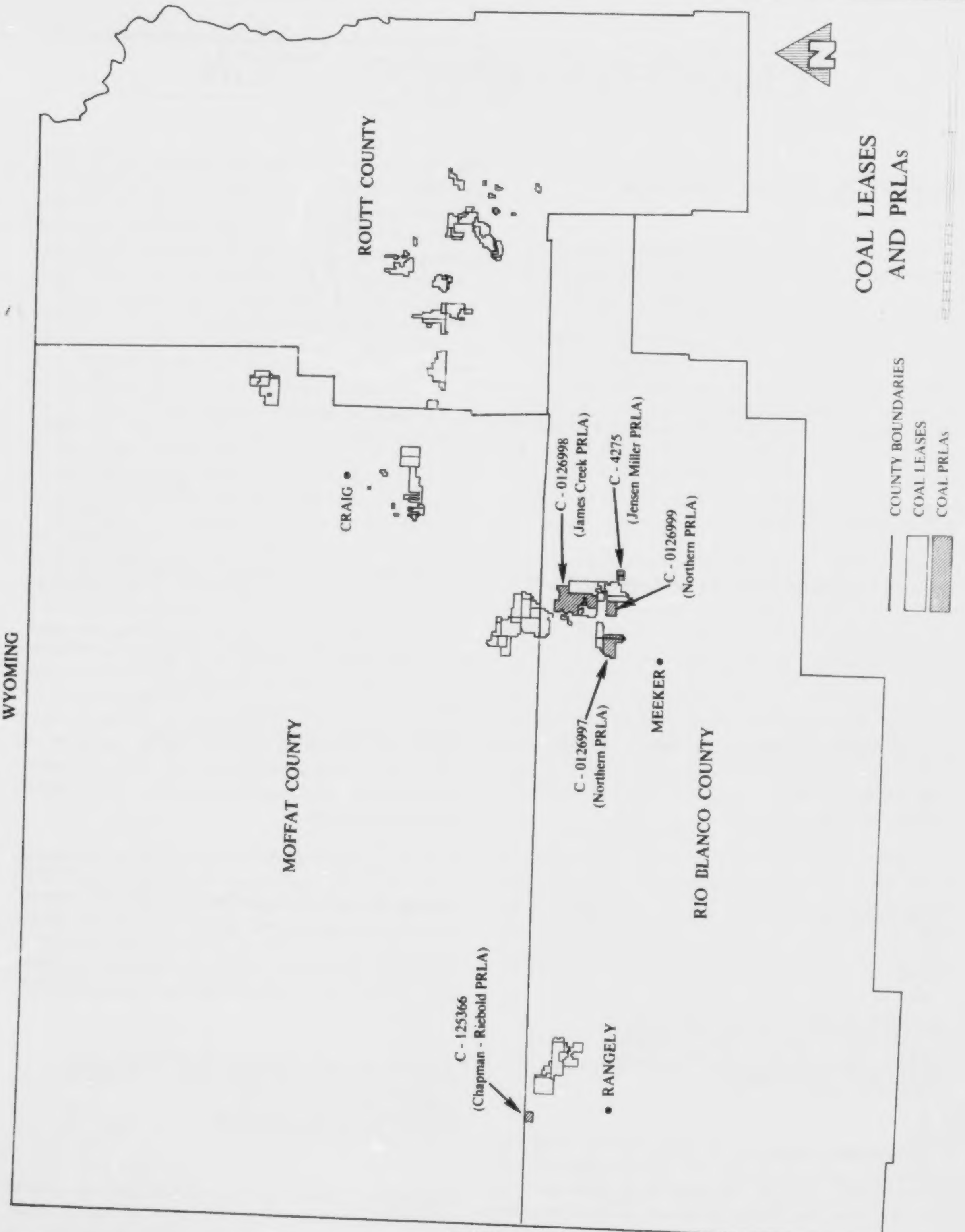
The Mineral Leasing Act of 1920 provided for the issuance of coal prospecting permits in unclaimed, undeveloped areas. Upon demonstrating that commercial quantities of coal had been discovered under terms of the permit, a noncompetitive coal lease could be issued for all or part of the land in the permit under this act.

The Federal Coal Leasing Amendments Act of 1976, repealed the Secretary of the Interior's authority to issue coal prospecting permits and noncompetitive coal leases. Subsequent regulations and policy were then developed to process the outstanding prospecting permits and preference right lease applications that were issued before the 1976 act. Processing requirements consist of the following steps: (1) submission of the preference right lease application by the applicant and acceptance of the application by the Bureau of Land Management; (2) submission of "initial showing" data by the applicant and determination by the Bureau either that the applicant has found a workable deposit of coal or that the application should be rejected; (3) environmental analysis by the Bureau of the applicant's proposal; (4) preparation by the Bureau of a proposed lease containing stipulations and mitigation measures; (5) submission by the applicant of the "final showing" of financial data demonstrating that the coal deposit can be mined at a profit (as a part of this step, the Bureau of Land Management will provide an opportunity for public review and comment on the costs of complying with all environmental stipulations in the lease and on the costs that the Bureau proposes to use in the determination of commercial quantities); and (6) determination by the Bureau either that the applicant has discovered commercial quantities of coal, in which case a preference right lease is issued, or that the applicant has failed to demonstrate the presence of commercial quantities of coal, in which case the preference right lease application is rejected.

BLM's Craig District Office prepared an environmental assessment (EA) in 1980 that addressed Consol's initial showing. Information in the EA, along with the amended initial showing subsequently filed by Consol, was used in determining that an EIS was needed. This was done so that any significant impacts of Consol's second proposal, as described in its amended initial showing, could be fully analyzed.

AUTHORIZING ACTIONS AND AGENCY INVOLVEMENT

The Bureau of Land Management will, upon completion of this EIS, request a final showing from Consol. BLM will use this analysis to determine what stipulations and mitigative measures should be placed in the request for final showing. The decision, as well as whether or not


WYOMING
UTAH
ROUTT COUNTY
MOFFAT COUNTY
RIO BLANCO COUNTY
CRAIG
MEEKER
RANGELY
C - 0126998 (James Creek PRLA)
C - 4275 (Jensen Miller PRLA)
C - 0126999 (Northern PRLA)
C - 0126997 (Northern PRLA)
C - 125366 (Chapman - Riebold PRLA)
N
COAL LEASES AND PRLAs
COUNTY BOUNDARIES
COAL LEASES
COAL PRLAs

Map 1-1 PRLA General Location Map

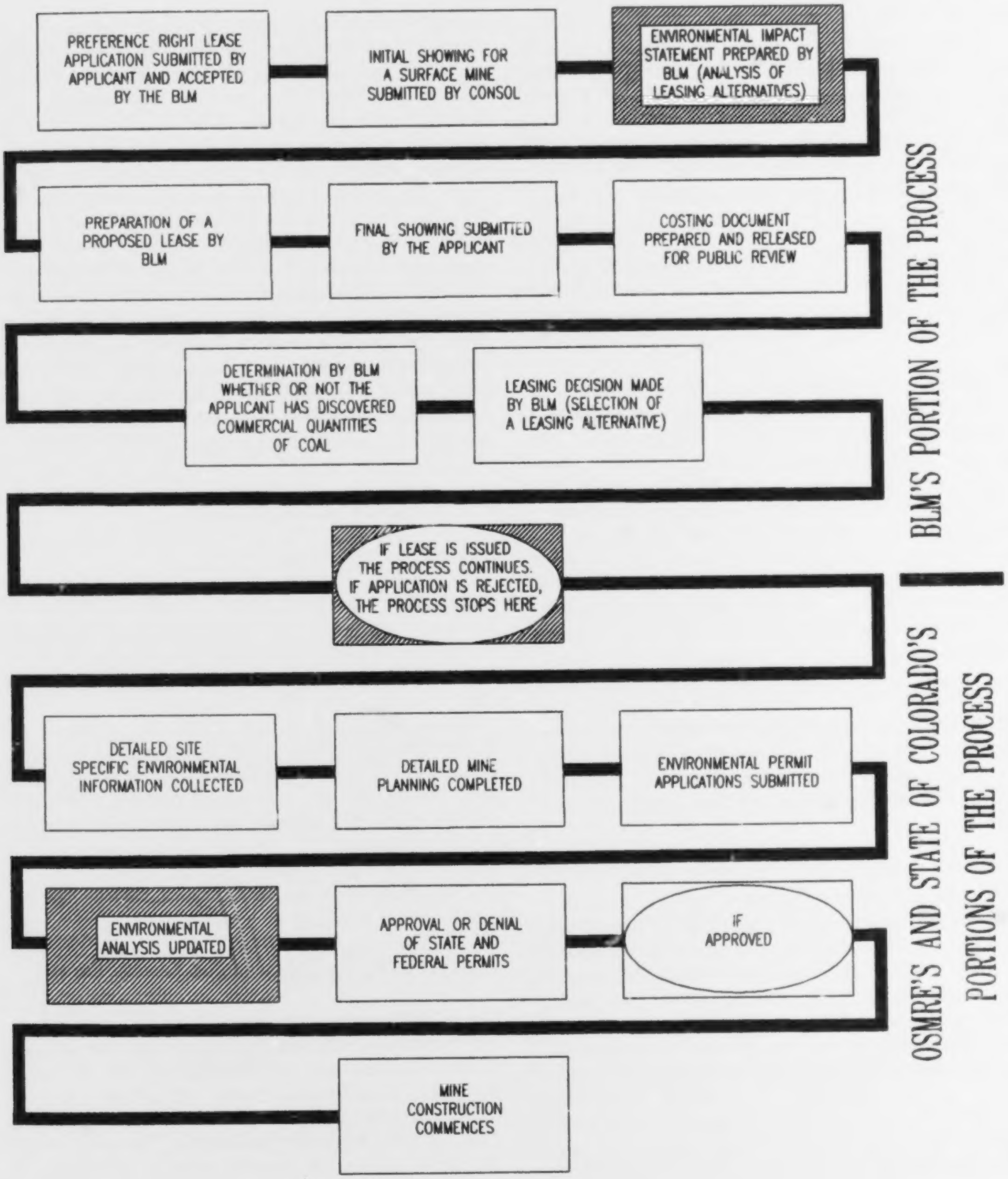

PREFERENCE RIGHT LEASE APPLICATION SUBMITTED BY APPLICANT AND ACCEPTED BY THE BLM
INITIAL SHOWING FOR A SURFACE MINE SUBMITTED BY CONSOL
ENVIRONMENTAL IMPACT STATEMENT PREPARED BY BLM (ANALYSIS OF LEASING ALTERNATIVES)
PREPARATION OF A PROPOSED LEASE BY BLM
FINAL SHOWING SUBMITTED BY THE APPLICANT
COSTING DOCUMENT PREPARED AND RELEASED FOR PUBLIC REVIEW
DETERMINATION BY BLM WHETHER OR NOT THE APPLICANT HAS DISCOVERED COMMERCIAL QUANTITIES OF COAL
LEASING DECISION MADE BY BLM (SELECTION OF A LEASING ALTERNATIVE)
IF LEASE IS ISSUED THE PROCESS CONTINUES. IF APPLICATION IS REJECTED, THE PROCESS STOPS HERE
DETAILED SITE SPECIFIC ENVIRONMENTAL INFORMATION COLLECTED
DETAILED MINE PLANNING COMPLETED
ENVIRONMENTAL PERMIT APPLICATIONS SUBMITTED
ENVIRONMENTAL ANALYSIS UPDATED
APPROVAL OR DENIAL OF STATE AND FEDERAL PERMITS
IF APPROVED
MINE CONSTRUCTION COMMENCES
BLM'S PORTION OF THE PROCESS
OSMRE'S AND STATE OF COLORADO'S PORTIONS OF THE PROCESS

Figure 1-1 PRLA Processing

Consol has met the final showing requirements as outlined in the regulations (43 CFR 3430), will be made by BLM's Colorado State Director.

The State Director will also make a land-use planning decision on the application of the unsuitability criteria, for which recommendations are contained in Appendix A. If Consol is successful in its final showing, the State Director may recommend an exchange or legislative action (specifics are discussed in Chapter 2), through BLM's Director, to the Secretary of the Interior, or BLM may issue a lease and Consol could develop a surface mine within the lease.

Because the Office of Surface Mining Reclamation and Enforcement (OSMRE) has expertise in hydrology and reclamation, and involvement in approval of any mining plan that might result from BLM's leasing decision, OSMRE has agreed to cooperate in preparing this EIS.

The Surface Mining Control and Reclamation Act of 1977 (SMCRA) gives OSMRE primary responsibility to administer programs that regulate surface coal mining operations on Federal lands and the surface effects of underground coal mining operations on Federal lands. Pursuant to Section 503 of SMCRA, the Colorado Mined Land Reclamation Division (CMLRD) developed and the Secretary of the Interior approved a permanent program authorizing CMLRD to regulate surface coal mining operations and surface effects of underground coal mining on non-Federal lands within the state of Colorado.

In September 1982, pursuant to Section 523(c) of SMCRA, CMLRD entered into a cooperative agreement with the Secretary of the Interior authorizing CMLRD to regulate surface coal mining operations and surface effects of underground mining on Federal lands within the state.

Under the cooperative agreement, Federal coal lease holders in Colorado must submit permit application packages to OSMRE and Colorado MLRD for proposed mining and reclamation operations on Federal lands in the state. Colorado MLRD reviews the packages to ensure that the permit application complies with the permitting requirements and that the coal mining operation will meet the permanent program's environmental performance standards; if it does comply, Colorado MLRD issues the lessee a state permit to conduct coal mining operations. OSMRE and other Federal agencies reviews ensure that the permit application packages comply with the coal lease; the Mineral Leasing Act of 1920; the National Environmental Policy Act of 1969; and other Federal laws and their attendant regulations. OSMRE recommends approval, with conditions, or disapproval of the mining plan to the Assistant Secretary for Land and Minerals Management. BLM and the surface-managing agency (if other than BLM) must concur with the recommendation, based on their review of the permit application package.

CMLRD enforces the state and Federal performance standards and permit requirements during the mine's operation and has primary authority in environmental emergencies. OSMRE oversees this enforcement. BLM has authority in emergencies where CMLRD or OSMRE inspectors cannot act before significant environmental harm or damage occurs.

The Colorado Division of Wildlife (CDOW) has been involved throughout the analysis process. About 4,200 acres of the surface estate of the PRLA and adjacent Federal lease are part of the Jensen State Wildlife Area (SWA), and high elk habitat values exist in the project area. About 2,200 acres of the Jensen SWA would be disturbed under the development scenarios. CDOW has participated in the development of the proposed lease stipulations, and will continue to be involved as a surface owner.

PRLA SPECIFICS

The PRLA (C-0126998) covers 5,099.31 acres in the James Creek drainage, about 9 miles northeast of Meeker, Colorado. The area is within the southeast part of the Danforth Hills Coal Field. The coal deposits occur in the Williams Fork Formation of Upper Cretaceous age.

Based on drilling data, Consolidation Coal Company's (Consol's) July 1, 1977, initial showing report identified 14.9 million tons of underground minable reserves in seven beds and 22.2 million tons of surface minable reserves in three beds.

Consol submitted an amended initial showing on September 27, 1982. It identified 665.8 million tons of surface recoverable reserves in 19 beds (737.2 million tons of minable reserves) in the entire PRLA.

Consol's subsequent supplement to the 1982 amended initial showing, (which reanalyzed the reserve data and took pit configuration and mine engineering into account), states that Consol would recover 380 million tons from the northern half of the PRLA and an adjacent Federal lease. Consol proposed an advancing pit surface mine that would extract coal from the 19 beds. The proposed mine life was 40 years.

In 1984, following an elk mitigation study, Consol revised their proposal so that only 280 million tons would be recovered through this mining operation. The mine life was shortened to 30 years, and the areas that had made up the last 10 years of mining in the supplement were identified as elk mitigation avoidance areas. Of this 280 million tons, about 190 million tons would be from the PRLA.

THE ENVIRONMENTAL IMPACT STATEMENT PROCESS

The EIS process includes: scoping, draft environmental impact statement (EIS), public comment period, and final EIS.

Public participation was solicited during the scoping process to help identify major issues and alternatives.

The EIS describes the existing affected environment, and discusses the environmental consequences of different leasing alternatives identified through scoping and the Bureau of Land Management's planning process. Mitigative measures and special stipulations have been developed during this analysis. The alternatives identified for analysis include:

1. No Action

2. Withdrawal/Just Compensation

3. Lease Exchange

4. Consol's Proposal

5. BLM's Preferred Alternative, which incorporates additional mitigation to Consol's proposal needed to protect the environment.

After publication of this final EIS, BLM will allow a 30-day waiting period for decisions relating to the final EIS. This waiting period will also serve as a protest period for the planning amendment.

CONSIDERATIONS FOR ANALYSIS

LEASING DECISIONS

A leasing alternative would be chosen at the time BLM makes a leasing decision (please refer to Figure 1-1).

No actual mine development is being proposed or authorized at this time. Analysis of an actual mining proposal would be done during the permitting process, prior to any development (see Figure 1-1). The lease, however, would convey a right of development within the general terms and conditions of the lease and the specific constraints identified during the permitting process.

The leasing and permitting process is outlined in Figure 1-1. The decisions in the process progress from very broad in leasing to very specific in permitting. In order to assess the potential impacts of development the applicant has, in conjunction with the BLM and CDOW, developed a scenario (which may or may not resemble the actual mine proposed and analyzed during the permitting process) to be used for analysis purposes in this EIS.

The scenario has been designed to represent the largest reasonably forseeable development of the PRLA. The environmental analysis has been tiered to focus on the issues which are ripe for decision and exclude from consideration issues which are not yet ripe. This is discussed in the Council on Environmental Quality's Regulations (40 CFR 1500).

The issues before BLM at this time have been summarized into the following questions.

- If the applicant were entitled to a lease (as outlined in 43 CFR 3430) what lease stipulations would be necessary to protect the environment, above those already required during the permitting process? (The costs of all stipulations will be used in making a determination whether or not the applicant is entitled to a lease.)

- Are the potential impacts of such a nature that mining should be precluded to protect the environment?

- What is the appropriate application of the criteria found at 43 CFR 3460 (these criteria are listed in Appendix A)?

AVAILABLE INFORMATION

As discussed earlier, the applicant has submitted to BLM a mining scenario designed to represent the largest reasonably foreseeable development of the PRLA. The information upon which the scenario is based is often of a general nature, and will be augmented during the permitting process. Enough information is available to identify broad areas of concern and place general constraints upon a lease.

Because it is not possible to identify the precise nature of future development with certainty, the constraints identified in the analysis are commensurably broad.

Enough information is available (as reflected in this EIS) to reasonably predict the impacts of any given proposal. What remains unknown at this time is the exact nature of

Enough information is available (as reflected in this EIS) to reasonably predict the impacts of any given proposal. What remains unknown at this time is the exact nature of a mine plan not yet developed. Specific information will be available for analysis during the permitting process, regarding the exact nature of proposed development. A more specific analysis on a definite proposal has therefore been deferred to the permitting process.

SITE SPECIFIC AND CUMULATIVE IMPACTS

This EIS addresses both site-specific and cumulative impacts. Site-specific impacts result directly from the proposed development scenario, and cumulative impacts result from the combined impacts of all projects within the area.

Development considered, for inclusion in the cumulative impact analysis for the various alternatives, forms a background or baseline against which to compare and contrast impacts of developing the PRLA (see the Economics section in Chapter 3 for more details on specific development considered).

RELATIONSHIP WITH OTHER COAL DEVELOPMENT AND LAND USE PLANS

Although Consol has other property in the area, no direct relationship exists between leasing and development of this PRLA and Consols' or other companies' coal development in the area. Consol has indicated, however, that this PRLA probably would be developed with an adjacent Federal lease as one operation. Thus, Consol included development of an adjacent Federal lease in its proposal. Its proposal has been preliminarily reviewed by BLM, and it appears reasonable. Because of the high probability of development of the PRLA with an adjacent Federal lease, both are being fully analyzed in this EIS. Map 1-2 shows the PRLA, its location, and other Federal coal leases in northwest Colorado.

No BLM land-use planning decision has been made on the PRLA or the adjacent Federal lease. No recommendation was made on application of the unsuitability criteria (40 CFR 3460) in BLM's White River Resource Area Management Framework Plan Amendment (December 1981). This EIS provides the analysis for a land-use plan amendment. BLM will make the land-use planning decision after the final EIS has been filed with EPA and before any decision has been made on the proposed mining activity. It will cover the project area (PRLA and an adjacent lease), as well as several other adjacent Federal coal leases, apply the unsuitability criteria to the PRLA, and make multiple use trade offs in the area already leased.

MATERIAL CONTAINED IN THE APPENDICES

Several appendices have been presented in this EIS to provide the reader with important information regarding this analysis. They are:

Appendix A - Unsuitability Analysis

Appendix B - Laws and Agencies Mitigating Coal Related Impacts

Appendix C - Coal Lease Form (Proposed Action and Preferred Alternative)

Appendix D - Development of Consol's Proposed Action and the Elk Mitigation Feasibility Assessment and Mitigation Plan

Appendix E - Regional Analysis of Cultural Resources

Appendix F - Mitigation Considered

Appendix G - Comments and Responses on the Draft EIS

Readers are encouragaed to read those appendices which cover an area of particular interest to them.

PUBLIC INVOLVEMENT

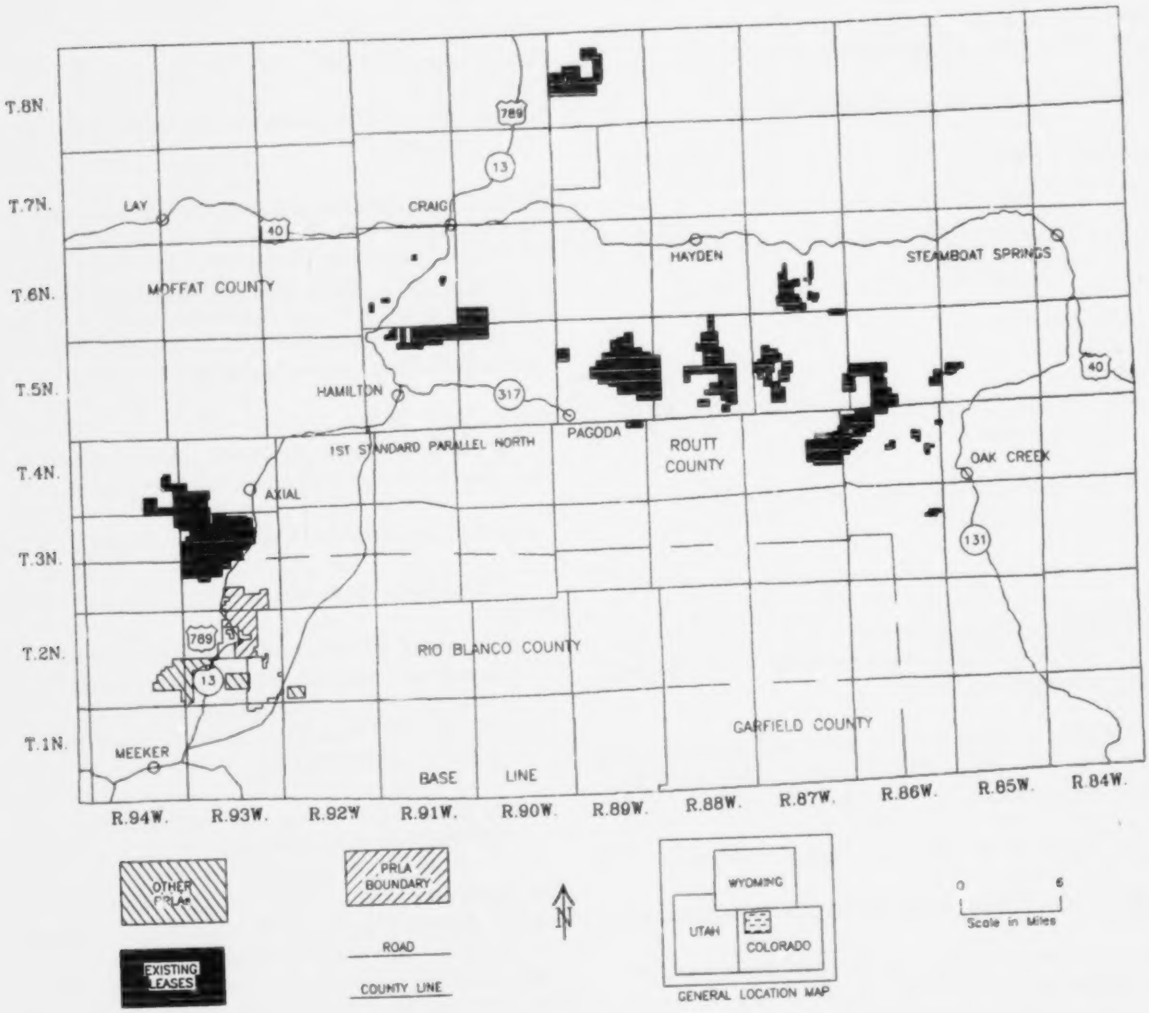
Public involvement occurred through the meetings and comment periods listed below:

Public comment period on the EA for C-0126998 from January 1 to February 1, 1982. A public meeting was held on January 27, 1982, 7:30 p.m., Fairfield Center, Meeker, Colorado.

Two sets of scoping meetings were held on this EIS. The first meetings were:

Meeker, Colorado
Date: January 23, 1984
Time: 7 p.m.
Address: BLM, White River Resource Area Office
2 miles west of Meeker, Colorado

Lakewood, Colorado
Date: January 24, 1984
Time: 2 p.m.


T.8N.
T.7N.
T.6N.
T.5N.
T.4N.
T.3N.
T.2N.
T.1N.
789
13
LAY
CRAIG
40
HAYDEN
STEAMBOAT SPRINGS
MOFFAT COUNTY
HAMILTON
317
PAGODA
1ST STANDARD PARALLEL NORTH
ROUTT COUNTY
OAK CREEK
AXIAL
131
RIO BLANCO COUNTY
GARFIELD COUNTY
MEEKER
BASE LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W.
R.89W.
R.88W.
R.87W.
R.86W.
R.85W.
R.84W.
OTHER PRLAs
PRLA BOUNDARY
EXISTING LEASES
ROAD
COUNTY LINE
N
WYOMING
UTAH
COLORADO
GENERAL LOCATION MAP
0
6
Scale in Miles

Map 1-2 Federal Coal Leases

Public comments were accepted from January 6, 1984, through February 6, 1984, (scoping period) on Consol's James Creek PRLA.

An information packet was also mailed out, as well as news releases to the local media.

The second set of scoping meetings were:

Meeker, Colorado
Date: March 18, 1985
Time: 7 p.m.
Address: BLM White River Resource Area Office
Meeker, Colordao

Craig, Colorado
Date: March 19, 1985
Time: 7 p.m.
Address: Craig District Office, 455 Emerson Street,
Craig, Colorado

The 1985 public comment scoping period ran from February 26 to April 18.

Four major areas of concern surfaced at these meetings:

1. Wildlife habitat, particularly for elk. This included short- and long-term impacts to winter range, calving areas, and migration routes.

2. Impacts to both surface water and groundwater resources in the area. This included the flow of James Creek and production of water from area wells.

3. The feasibility and effect of reclamation efforts.

4. Economic impacts to Rio Blanco and Moffat counties.

As a result of the scoping process, BLM determined that subsidence was not an issue. Because there are no anticipated or forseeable impacts from subsidence, it has not been carried forward for a detailed analysis.

Two public comment periods on the draft EIS were held from November 22, 1985 to February 28, 1986, and from December 28, 1987 to February 5, 1988.

Public meetings were also held as follows:

Meeker, Colorado
Date: January 15, 1986
Time: 7:30 p.m.
Address: BLM, White River Resource Area Office,
2 miles west of Meeker, Colorado

Grand Junction, Colorado
Date: January 16, 1987
Time: 7:30 p.m.
Address: Grand Junction Hilton, 743 Horizon Dr.,
Grand Junction, Colorado

Lakewood, Colorado
Date: Febuary 25, 1986
Time: 7:30 p.m.
Address: Sheraton Inn, Sixth and Union, Lakewood,
Colorado

The proposed land use planning decisions are protestable. Protests should be sent to the Director (760), BLM, Premier Building, Room 906, 1725 I Street, N.W., Washington, D.C. 20240, within 30 days of the date of publication of the Notice of Availability by the U. S. Environmental Protection Agency in the Federal Register. Protests should include the following information:

- The name, mailing address, telephone number, and interest of the person filing the protest;
- A statement of the issue or issues being protested;
- A statement of the part or parts being protested;
- A copy of all documents addressing the issue or issues that were submitted during the planning process by the protesting party or an indiction of the date the issue or issues were discussed for public records; and
- A short concise statement explaining why the proposed decision is wrong.

After the 30-day protest period and Governor's Consistency Review, the BLM Colorado State Director may approve the plan, excluding any portion under protest. A record of decision, outlining the amendment to the White River Resource Area Management Framework Plan will then be published.

For more information contact:

Greg Goodenow, Project Manager
Craig District Office
Bureau of Land Management
455 Emerson Street
Craig, Colorado 81625

CHAPTER TWO

ALTERNATIVES

CHAPTER 2—ALTERNATIVES

INTRODUCTION

As outlined in Chapter 1, this EIS addresses leasing alternatives. Prior to final alternative selection BLM will request a final showing from the applicant that takes into consideration the requirements outlined in the lease form. The costs of the requirements will be considered in making the commercial quantities determination.

After the commercial quantities determination has been made, one of the alternatives will be selected by the BLM.

The development scenarios presented in the EIS represent what might reasonably occur. No development is being approved or permitted at this time. The scenarios have been developed for analysis purposes, so that potential impacts of the various alternatives can be compared. The applicant could provide another scenario in the commercial quantities determination, or an entirely different proposal for permitting purposes. With these uncertainties in mind, BLM has proceeded with the analysis of a large surface mine, as the maximum reasonably forseeable development.

Approval of actual development activities would be accomplished at a later date by the Office of Surface Mining Reclamation and Enforcement, and the Colorado Mined Land Reclamation Division. BLM's preferred alternative stresses performance standards which have a broader base of application than specific design criteria.

The following alternatives have been developed and analyzed fully:

- No Action. Under this alternative the PRLA would not be leased or developed because Consol would not be able to meet final showing requirements.
- Withdrawal/Just Compensation. The Secretary of the Interior, exhausting all other authority to protect the environment, could request Congress to withdraw, purchase, or withdraw and purchase Consol's interest in the property. As with No Action, the PRLA would not be developed.
- Lease Exchange. A lease exchange could be negotiated for coal (congressional action), other minerals, coal lease modifications, or lease bidding rights of equal value. The PRLA would not be developed under this alternative. Congressional authorization would be required for the coal lease exchange.
- Consol's Proposal. Consol's proposal calls for a maximum production rate of 10 million tons per year. Total production during the 30-year mine life would be 280 million tons. The proposal would include all mitigation and compliance with applicable laws and regulations. Complete discussions are provided in Appendixes B, C, and D.
- BLM's Preferred Alternative. The Preferred Alternative results from special mitigation added to Consol's proposal.

To simplify the discussion of the impacts and alternatives and because the first three alternatives all result in no development of, and no impact to, the project area, they have been grouped together in the analysis. They are presented as the No Action/No Development alternatives.

Because the Proposed Action and BLM's Preferred Alternative result in the development of the PRLA, the EIS refers to them as Development alternatives, when appropriate.

Table S-1 (see Summary) summarizes the impact of each alternative. Chapter 3, Affected Environment and Environmental Consequences, presents a full discussion of these impacts.

FORMULATION OF ALTERNATIVES

The alternatives reflect foreseeable regional development and the resultant impacts. Regional cumulative analysis was made as accurately as possible. Supply and demand for coal was the critical component of the analysis.

SUPPLY AND DEMAND

Because future production will depend on actual demand, BLM identified probable production levels and development in northwest Colorado. The following explains the methodology for this analysis.

Projected Demand for Northwest Colorado Coal

Four projections were analyzed to predict the demand for coal in northwest Colorado through the year 2000. The projections were supplied by: (1) Department of Energy, Energy Information Agency (1983) (1986) (1987); (2) Department of the Interior (1984); (3) State of Colorado, Geological Survey (1984); and (4) BLM Craig District (1985). The results predicted a demand for 16 to 20 million tons of coal annually from northwest Colorado by the year 2000. Based on current permitted production and the coal under lease, an ample supply is available to meet this projected demand (Figures 2-1 and 2-2 and Table 2-1).

Projected Development

Development projections were calculated by using activities selected from the Basic Activity System of the Planning and Assessment System (PAS) of the state of Colorado. The PAS was created to analyze the cumulative impacts of oil shale, coal, and other energy projects and basic industrial sector activities in the region. Private industry and local, state and Federal governments established and maintain a common base of methodology, data, and assumptions about future regional projects. All projected development assumed in this analysis has been extrapolated from this process, and all energy related projects have been considered.

CONDITIONS UNDER WHICH THE PRLA WOULD NOT BE DEVELOPED

If the applicant failed to demonstrate that commercial quantities of coal were discovered and could be developed economically within environmental constraints (43 CFR 3430), the PRLA would be rejected, a lease would not be issued, and the area would not be mined.

If the applicant could demonstrate that coal could be developed economically, but the Secretary determined that it would not be in the public interest to allow coal leasing on the PRLA area, the following two alternatives could be implemented.

- A lease exchange could be negotiated for coal, a coal lease modification, other minerals, or lease bidding rights of equal value. Congressional authorization would be required for the coal lease exchange. If an exchange became desirable and the applicant and the department agreed on a proposed tract for exchange, an appropriate environmental analysis of the impacts of leasing that tract would be prepared. Because no exchanges have yet been proposed for this PRLA, no analyses have been developed.

- The Secretary of the Interior, lacking other authority to protect the environment, could request legislation from the Congress to purchase Consol's interest in the property, if a coal lease exchange proposal were determined to not be feasible by the Secretary or if the applicant declined to accept an exchange offer by the Secretary.

Under each of these alternatives (no action, exchange, or withdrawal/compensation) the environmental impacts on the PRLA area would be the same; no environmental impacts on the PRLA area would occur.

In addition should the applicant qualify for and be granted a lease, and a mine be permitted, but be unable to market this coal; no development will occur and no impacts will be generated.

CONDITIONS UNDER WHICH THE PRLA COULD BE DEVELOPED

Several conditions must be met before the area could be mined. This includes both regulatory (items 1, 2, and 3) and economic (item 4) requirements.

1. The applicant must meet all the conditions and stipulations of final showing, and demonstrate environmental damage can be avoided, or provide acceptable mitigation.

2. The Bureau of Land Management would have to issue the lease.

3. A formal mine plan must be prepared, submitted and approved by the regulatory agencies.

4. Consol would have to capture a share of the coal market.

Should Consol qualify for and be granted a lease, and a mine be permitted, production from this area would likely replace other production from northwest Colorado rather than increase production from the region.

Appendix B contains copies of the laws mitigating coal related impacts and a list of agencies responsible for administering these laws.

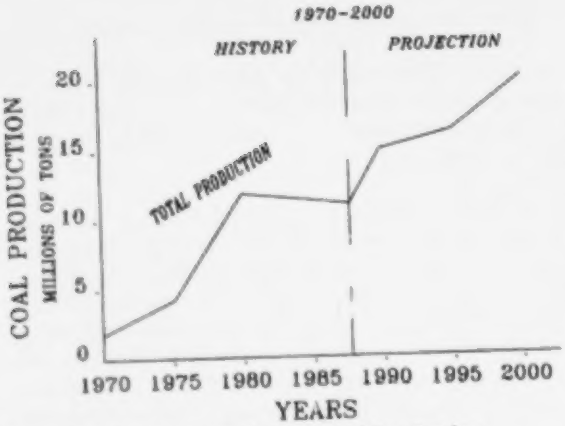


Figure 2-1 Northwest Colorado Coal Production

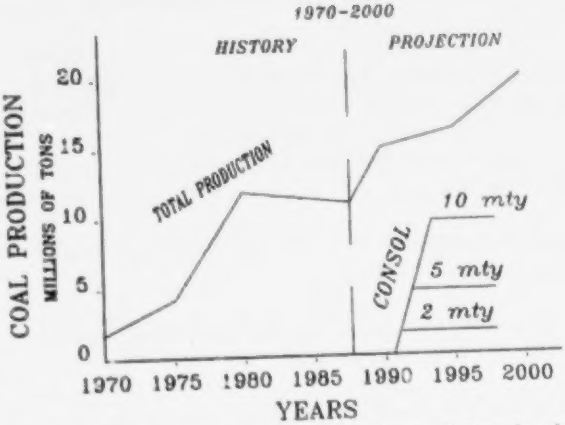


Figure 2-2 Coal Production in Northwest Colorado with PRLA

TABLE 2-1
DISTRIBUTION OF COAL PRODUCTION
IN NORTHWEST COLORADO, ALL ALTERNATIVES

	1985		1987		1991		1995		2000	
	Consol PRLA	Other[1] Mines	Consol PRLA	Other Mines	Consol PRLA	Other Mines	Consol PRLA	Other Mines	Consol PRLA	Other Mines
No Development	0	11.7	0	11.4	0	15	0	16	0	20
Development 10 mty	0	N/A	0	N/A	10	5	10	6	10	10
Total Production	1985	11.7	1987 -	11.4	1991[1] -	15	1995[2] -	16	2000[2] -	20

1/ Other mines includes all other existing and proposed mines in Northwest Colorado
2/ Time frames were developed based on Consol's proposal
3/ mty = million tons per year

NO ACTION/NO DEVELOPMENT ALTERNATIVES

These alternatives assume that if the PRLA were not developed, increases in coal production through 2000 would be allocated to existing regional coal mines, depending on market conditions. Under current conditions, enough coal is available in existing permitted mines for production of up to 29 million tons annually. Production met a demand for 9.2 million tons in 1984, 11.7 million tons in 1985, and 11.4 million tons in 1987. Demand by 2000 is projected to be between 16 and 20 million tons (Figure 2-1) and an ample leased supply appears available to meet the projected demand. Under these alternatives, any additional coal output would be handled by existing coal mines and would not include the Consol PRLA. See Table 2-1 and Figure 2-2 for the distribution of coal production under this and other alternatives.

If Consol did not develop the PRLA, present trends and conditions of the renewable resources would continue.

DEVELOPMENT ALTERNATIVES

CONSOL'S PROPOSED ACTION ALTERNATIVE

The evolution of Consol's surface mining scenario, including the mitigation plan, is presented in Appendix D.

Consol would use an advancing open pit operation. Coal production begins at 2 million tons for year 1 and increases annually by 2 million tons per year until year 5, with the maximum production of 10 million tons per year. This would produce 280 million tons of coal over a 30-year mine life.

Consol developed the mining unit from the available coal reserves within the PRLA and an adjacent Federal lease that is held by Consol. The mining unit is based on the following criteria, which have been developed and identified by Consol:

1. Marketing would require a 30 year, 10-million-ton-per-year contiguous reserve.

2. A maximum pit depth of approximately 800 feet would be necessary to be economically competitive.

3. Avoidance of the Sulfur Creek Syncline area, where the coal seams of interest are displaced about 2,000 feet deeper than the same seams in the mining unit.

4. Avoidance of the Ninemile Gap elk migration corridor.

Mining would commence in the headwaters of James Creek northeast of Ninemile Gap (section 12) and would progress southeasterly for approximately 3 1/2 years. Mining would then proceed northwest of the original pit, arriving at the northern PRLA boundary in the 23rd production year. The remaining 7 years of production would be spent mining the ridge from north to south between Highway 13 and James Creek, ending, as necessary, to protect the Ninemile Gap elk migration route. Locations of approximate mining areas by year, support facilities, and stockpile locations are illustrated in Map 2-1. Annual disturbance by year is summarized in Table 2-2.

At initial pit development, topsoil, which averages 23 inches in depth, would be removed using 31-cubic-yard scrapers and stockpiled. In areas with greater than 23 inches of topsoil, truck/shovels may be used, and on slopes of greater than 30 percent, bulldozers may be necessary. Consol would stabilize the stockpiled topsoil and then redistribute it as soon as possible.

The exposed overburden and thick interburden would be loosened by blasting, loaded into 170-ton dump trucks by electric shovels and front-end loaders, and then hauled to either a stockpile or to available spoil sites within the pit. The in-pit spoil would be used to reconstruct benches in the mined areas. Average pit size would be about 400 surface acres, and be about 500 feet deep (Figure 2-3).

Map 2-1 illustrates the areas annually disturbed by mining. Consol would begin reclamation on the areas immediately after backfilling. The final slopes would be regraded to a 2.25:1 slope or flatter to ensure long-term slope stability. The ridges on either side of James Creek and the disturbed areas in its upper reaches would be reclaimed to approximately their original contour.

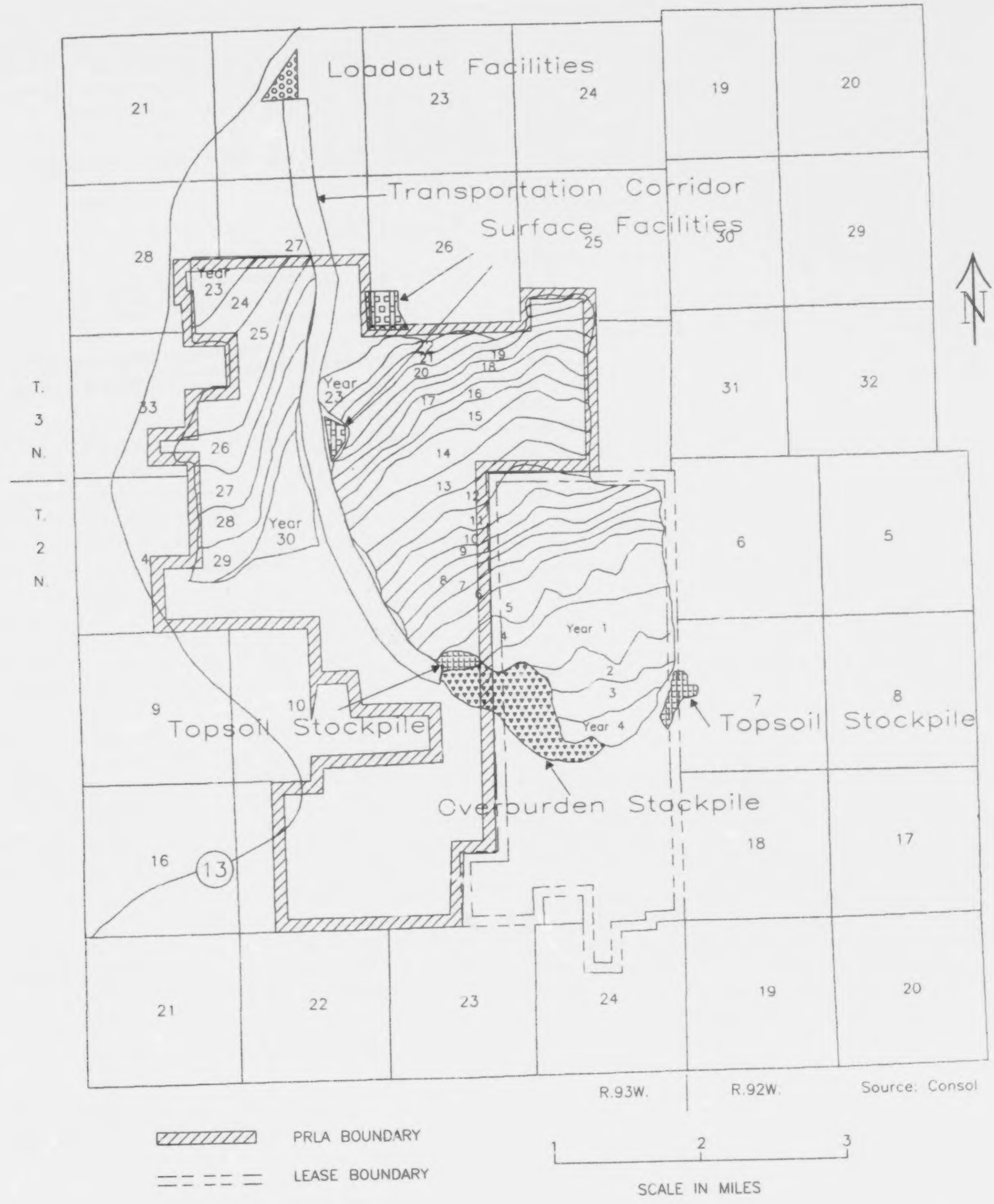
Detailed commitments to slope lengths, terraces, drainage densities, erosion control, and revegetation in the permit application could require changing the post-mining topography.

Typically, reclamation would begin within 3 to 5 years after mining; however, this could be as long as 7 years, requiring temporary topsoil and overburden stockpiles. The final pit would be backfilled and graded within 3 years of production termination and would conform to the surrounding topography as much as possible. All reclamation must meet Office of Surface Mining and Colorado Mined Land Reclamation Division standards.

TABLE 2-2
ANNUAL MINING DISTURBANCE*

Year	Approximate Acres Disturbed
1	265
2	178
3	105
4	233
5	194
6	142
7	100
8	86
9	106
10	111
11	148
12	143
13	169
14	196
15	121
16	101
17	93
18	94
19	95
20	91
21	76
22	61
23	47
24	176
25	172
26	121
27	117
28	108
29	79
30	119

*Does not include acreage associated with permanent facilities, i.e., shop, bathhouse, etc., (Consol 1984b)


Loadout Facilities
Transportation Corridor
Surface Facilities
Topsoil Stockpile
Topsoil Stockpile
Overburden Stockpile
Year 23
Year 30
Year 1
Year 4
T. 3 N.
T. 2 N.
R.93W.
R.92W.
13
PRLA BOUNDARY
LEASE BOUNDARY
SCALE IN MILES
1
2
3
N

Source: Consol

MAP 2-1 Area Disturbance by Year and Proposed Facility Areas

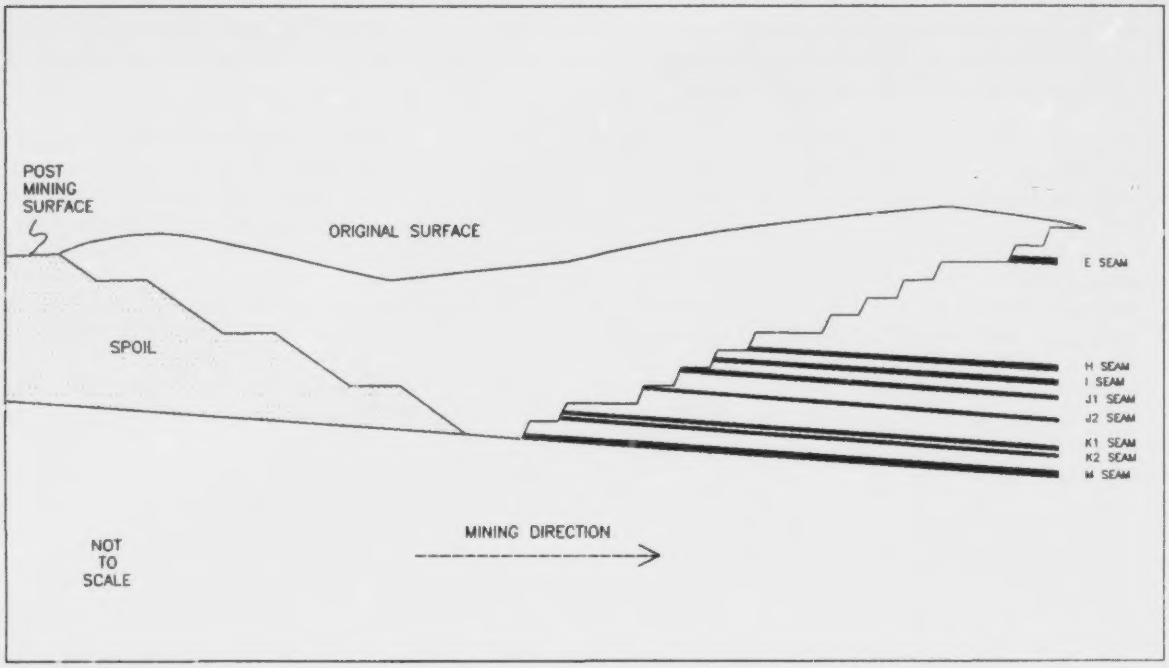
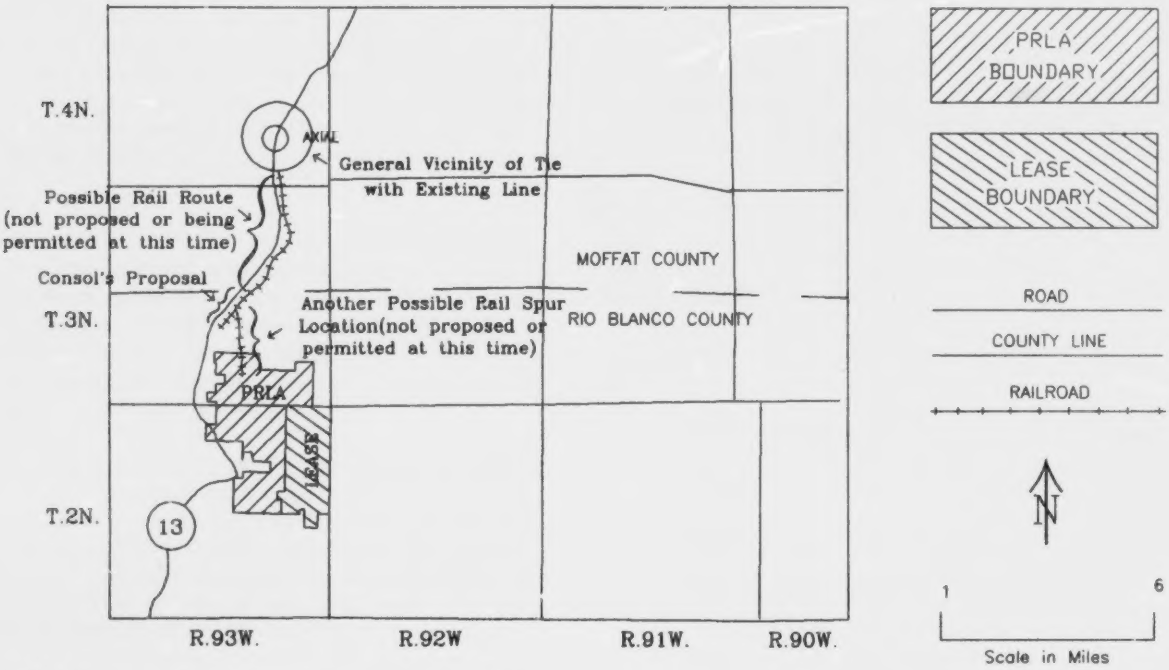

POST
MINING
SURFACE
ORIGINAL SURFACE
SPOIL
E SEAM
H SEAM
I SEAM
J1 SEAM
J2 SEAM
K1 SEAM
K2 SEAM
M SEAM
MINING DIRECTION
NOT
TO
SCALE

Figure 2-3 Typical Pit Cross Section

Taken from CONSOL


T.4N.
T.3N.
T.2N.
AXIAL
General Vicinity of Tie with Existing Line
Possible Rail Route (not proposed or being permitted at this time)
Consol's Proposal
Another Possible Rail Spur Location(not proposed or permitted at this time)
MOFFAT COUNTY
RIO BLANCO COUNTY
PRLA
LEASE
13
R.93W.
R.92W
R.91W.
R.90W.
PRLA BOUNDARY
LEASE BOUNDARY
ROAD
COUNTY LINE
RAILROAD
N
1
6
Scale in Miles

Map 2-2 Approximate Locations of Railroad Lines

Consol's proposal has undergone several changes to reflect mitigation for elk habitat. Consol has worked closely with the Colorado Division of Wildlife in preparing the present proposal. BLM recognizes that the actual mining scenario may change greatly prior to actual development, however, the scenario presents a reasonable picture of the maximum forseeable development.

Consol has proposed the mitigation plan that appears in Appendix D. It is an integral part of the analysis in this EIS. It has been presented in its entirety because of the key role it has in Consol's proposal.

TRANSPORTATION OF COAL FROM THE PRLA

Consol anticipates transporting coal by rail, however, no proposal has been made at this time to construct a rail line, and no right-of-way or permit is under consideration. No action on a rail line is being considered as a part of the leasing decision. In order to fully disclose possible impacts related to potential development of the PRLA, however, BLM has developed a rail line scenario for analysis purposes. While BLM sees the scenario as technically possible, what might actually occur is highly questionable. This scenario is not being proposed or recommended by BLM, or Consol.

Under the scenario a new rail line would tie in with the existing line which serves Colowyo Coal Company, in the vicinity of Axial (see Map 2-2). Another company may build and own the track.

Because of the wildlife habitat and wetlands present in the bottom of Good Spring Creek, it is possible that the Army Corps of Engineers, U. S. Fish and Wildlife Service, BLM, and the Interstate Commerce Commission, as well as several state agencies may have jurisdictional roles. These agencies may become involved if and when a rail line is proposed, or a permit for construction is requested.

PREFERRED ALTERNATIVE

The Preferred Alternative emphasizes coal production and protection of the other natural resources within the PRLA and surrounding affected areas. The lease form and stipulations, as they would appear when sent to Consol in the Request for Final Showing, are presented in Appendix C. BLM's alternative adds mitigation measures for various resources to Consol's Proposed Action.

WILDLIFE

Approval for development of the project will require that prior to development impacts to raptors or raptor nest sites be identified. Consol will notify and obtain from the USFWS and CDOW approval for site-specific plans to avoid and/or mitigate adverse impacts to raptor species, consistent with the regulatory authority of these agencies and programs.

SOILS

Consol has agreed that all areas disturbed by the proposed action would be reclaimed and stabilized as soon as possible following the disturbance. In addition, soil removed from aspen sites would: 1) be placed immediately on regraded backfill where aspen would be established, or 2) be stockpiled separately and redistributed in areas where aspen would be established. These practices will be required if they are needed to meet the aspen reclamation standard discussed under Vegetation. They will be analyzed in an aspen reclamation study.

Consol would determine the available moisture percentage (defined as the difference between one-third and 15 atmosphere moisture percentages) on all major areas of aspen soil prior to their disturbance. Postdisturbance aspen soils would duplicate these available moisture percentage as nearly as possible (the exact depth and variation from the predisturbance soil values would be determined at the mine plan stage).

If sufficient quantities of topsoil were confirmed by the detailed soil survey during mine planning, topsoil under aspen stands would be replaced to natural depths, or 2.5 feet, whichever is less.

In addition to standard soil tests, the applicant would conduct the following analyses: organic matter, microbial populations and diversity, and carbon/nitrogen ratios.

Actual reclamation would not be done until aspen stands have been disturbed through mining. However, Consol would be required to conduct studies prior to disturbance, in similar habitat and ecologic conditions, which would indicate success in reclaiming aspen. Reclamation would verify these studies on aspen reclamation techniques (including creation of perched water tables) and creation of artificial seeps. Actual parameters of these studies, i.e., objectives, timeframe, location, size, would be deferred until Permit Application Process unless Consol wished to begin it earlier. If techniques could be developed that would show statistical improvements in reclaimed aspen densities or growth and creation of alternate water sources, the techniques would be incorporated into the overall reclamation plan. Aspen reclamation techniques which are proven elsewhere (in the timeframe between this analysis and actual mine construction) may be incorporated into the reclamation plan without reanalyzing them through an Aspen reclamation study.

VEGETATION

The following would be added to Consol's proposed methods of reestablishing vegetation. Postmine vegetation would be composed of 50 percent shrubland, 25 percent aspen, and 25 percent grassland. A minimum postmine aspen stand standard to be met at bond release would:

- Have a minimum density of 500 stems per acre, and
- Have survived at least 5 years.
- Be at least 5 feet tall.

Unless the applicant could demonstrate that another standard will result in establishment of an aspen stand similar to premining conditions.

WATER RESOURCES (SURFACE AND GROUNDWATER)

The BLM would require measures to reduce the impact to quality and quantity of water located on and near the PRLA and lease C-093713. Measures could include establishing a buffer zone (some activities would be allowed provided Consol could demonstrate to BLM that these activities would not significantly affect the water quality and quantity in James Creek or the stability of the channel) along James Creek, designing sediment ponds to withstand a 40-year, 24 hour storm, creating artificial seep areas (although experimental and not proven, BLM anticipates this could be successfully accomplished), stabilizing stream banks and channels, terracing lands adjacent to waterways to maintain flow and water quality in James Creek, minimizing transportation-related disturbances in James Creek through the use of transportation techniques such as a conveyor system where practical, and minimizing impacts in the main James Creek channel resulting the overburden stockpiles. Detailed designs would be prepared during mining permitting.

CULTURAL AND PALEONTOLOGICAL RESOURCES

Additional stipulations will be required to protect cultural and paleontological resources. See the stipulations in Appendix C.

ALTERNATIVES IDENTIFIED BUT ELIMINATED FROM FURTHER DETAILED STUDY

UNDERGROUND MINING

Underground mining is not considered to be a reasonable alternative at this time, because of market conditions and the cost of extracting the coal. There is currently no proposal to mine the coal on the PRLA and adjacent federal lease through underground mining methods.

OTHER LOCATIONS FOR DEVELOPMENT (FOR UNDERGROUND OR SURFACE DEVELOPMENT)

No other tracts were considered as alternatives at this time because the PRLA is not moveable. Development of an adjacent lease, in conjunction with the PRLA, is a very strong possibility. Consol has, therefore, included it in their proposal.

OTHER PRODUCTION LEVELS

To explore a wider range of alternatives, BLM considered Consol's production at 2 and 5 million tons per year during scoping/preliminary analysis. Because impacts are largely based on disturbance rather than production, no major differences in impacts are expected to occur from lower PRLA development levels. Surface disturbance, based on current reserve information, is not directly related to production levels. This is because higher production levels may result from developing deeper seams of coal, not just mining a larger area.

If subsequent information in the Permit Application Package indicates production-level related impacts, they will be addressed at that time. Coal production for northwest Colorado is expected to remain about the same, with or without development of this PRLA.

ADDITIONAL LEASE STIPULATIONS

Additional lease stipulations were initially considered for inclusion in BLM's preferred alternative. It was decided to analyze only those performance standards deemed necessary for environmental protection, above and beyond what was proposed by Consol, or required during the permitting process. Any less mitigation would have allowed undue environmental degradation. Additional mitigation was not analyzed where mitigation in BLM's preferred alternative reduced the impacts to an insignificant level.

The development of the stipulations incorporated into the preferred alternative is contained in Appendix F. This process involved the Colorado Division of Wildlife, the Office of Surface Mining Reclamation and Enforcement, Colorado Mined Land Reclamation Division, U.S. Fish and Wildlife Service, the Environmental Protection Agency, the applicant, and Camp Dresser and McKee.

Of particular concern during this process was the uncertain nature of actual mine configuration, and the desire to insure broad applicability of any stipulation that might be proposed. Also an effort was made to avoid unnecessary duplication of regulations and requirements of the permitting system.

PERFORMANCE STANDARDS VERSUS DESIGN CRITERIA

Several design criteria (specific mining and construction methods) that would have altered mine configuration were also initially considered. But after preliminary analysis it became apparent that, prior to the time that an actual mine plan is proposed (this would not occur until the permitting process), design criteria would only fit an extremely small number of situations, out of an extremely large spectrum. Throughout most of the spectrum, design criteria based on an unknown mine plan would not serve to protect the environment to the necessary degree, and at the same time could prove to be an impediment to the orderly development of the coal resource.

Performance standards require that an impact be mitigated to a given level, but does not require a specific methodology.

Several groups of agencies were involved in the discussions. The uncertain nature of actual mine configuration, broad applicability, and avoidance of unnecessary duplication of the regulations and requirements of the permitting system were areas of concern. Because of these concerns, BLM's Preferred Alternative incorporates performance standards (or a combination of performance standards and design criteria) rather than just design criteria.

NOT ALLOWING SURFACE MINING

This alternative was considered during application of the criteria found at 43 CFR 3461 "Federal Lands Review-Unsuitability for Mining". Finding the area unsuitable under criterion 15 (wildlife) was considered. Only after consultation and coordination with the Colorado Division of Wildlife (CDOW), and preliminary analyses, was it determined that certain stipulated methods of mining would not have a significant long-term impact on the species (elk in this instance) being protected. CDOW position letters have appeared in the Draft and Final EIS. (See the stipulations for BLM's preferred alternative in Appendix C.)

The stipulations contained in Appendix C require a very high standard of mitigation. With the level of mitigation in mind, and concurrence by the CDOW, to preclude analysis of surface mining operations at this point in time would be unwarranted and unreasonable.

MAJOR FEDERAL LAWS MITIGATING COAL-RELATED IMPACTS

This analysis assumes enforcement and compliance with all environmental-protection laws and regulations. Because many laws and regulations pertaining to the coal industry are in place, many otherwise significant impacts are already mitigated.

Appendix B summarizes the major laws and agencies controlling the leasing and mining of Federal coal resources.

SUMMARY OF THE IMPACTS AND COMPARISON OF ALTERNATIVES

The following narrative compares the impacts for each alternative. A complete analysis of the impacts is presented in Chapter 3 under the respective sections. The proposed stipulations as they would be applied to each alternative are listed in Appendix C.

WILDLIFE

Elk Habitat

No Action/No Development Alternatives. There would be no impacts to elk winter concentration areas, elk calving areas, or areas suitable as winter or year-round elk habitat.

Consol's Proposed Action. Some elk winter concentration areas, elk calving areas, and range suitable as winter or year-round elk habitat would be temporarily lost. Impacts would be reduced to an acceptable level by enhancement of other nearby areas.

BLM's Preferred Alternative. Same as the Proposed Action.

Other Wildlife

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. Existing raptor nests would be destroyed.

BLM's Preferred Alternative. Raptors would be protected by mitigation identified by U.S. Fish and Wildlife Service during the mine permitting process.

Establishment of buffer areas (consistent with mine planning) would reduce impacts on beaver by maintaining an adequate water supply in James Creek, as discussed under Surface Water in Chapter 3.

SOILS

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. The natural soil system would be mixed and the resulting properties altered.

BLM's Preferred Alternative. Study and implementation of effective reclamation techniques, including reestablishment of Aspen, would be required.

TOPOGRAPHY

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. Each landform element would be restored in the postmining landscape of the coal lease. Construction of swales, water impoundments and larger drainage features would be undertaken. Benches on north-facing slopes would be constructed. Postmining topography would change slightly from premining topography, but impacts would not be significant.

BLM's Preferred Alternative. Similar to the Proposed Alternative; however, terraces and benches would also be located on slopes adjacent to major waterways, consistent with requirements to reclaim to the approximate original contour. Postmining topography would change slightly from premining topography, but impacts would not be significant.

SURFACE WATER

No Action/No Development Alternative. Management practices associated with undeveloped rangeland would continue with no significant impacts to surface water resources. Portions of the James Creek channel could continue to degrade, and be prone to downcutting and high sediment yield, until natural controls are established.

Consol's Proposed Action. Potentially significant alteration of the quantity and quality of surface water.

Alteration of the hydrologic regime of James Creek would result in earlier peak flows, lower peak flows, increased mean general runoff, and higher base flows after reclamation.

Present channel morphology for portions of James Creek, Elkhorn Creek, Little Creek, and Good Spring Creek would be altered.

Surface water quality would be altered. Spoils aquifer water contributions to surface water systems would increase total dissolved solid values on-site and off-site. Increased total suspended solid values are expected on-site in the James Creek, Good Spring Creek, Elkhorn Creek, and Little Creek watersheds during the mining and reclamation phases. Total suspended solids values should not significantly increase off-site. Some existing uses may be precluded.

BLM's Preferred Alternative. Impacts would be similar to the Proposed Action; however, mitigation would lessen the severity of the impacts to surface water resources.

GROUNDWATER

No Action/No Development Alternative. The flow of springs and seeps in or near the project area would continue. There would be no significant impacts to groundwater resources.

Consol's Proposed Action. The flow of existing springs in or near the proposed mining area would be displaced, reduced, or eliminated.

Total dissolved solid concentrations would increase in the project area's groundwater.

Mining would change present aquifer properties and groundwater flow patterns.

Owners of water rights (other than the mining operator) may require compensation if these water supplies are contaminated, diminished, or interrupted.

Impacts to groundwater have the potential to become significant.

BLM's Preferred Alternative. Same as Proposed Action.

ALLUIVAL VALLEY FLOORS

No Action/No Development Alternative. Management practices associated with undeveloped rangeland would continue with no significant impacts to proposed alluvial valley floors.

Consol's Proposed Action. Construction and use of a rail spur, increased levels of total dissolved solids, and alteration of the James Creek hydrologic regime might impact proposed alluvial valley floors in Good Spring and James creeks. With required mitigation (OSMRE and CMLRD), significant impacts would be precluded.

BLM's Preferred Alternative. Inputs would be the same as under the Proposed Action.

FLOODPLAINS

No Action/No Development Alternative. Existing impacts would continue.

Consol's Proposed Action. Design of facilities "... will emphasize minimizing impacts to James Creek channel and floodplain. Where impacts are unavoidable temporary stream modifications will be designed to safely pass the 100-year, 24-hour storm" (Consol 1984). Because of this design criteria, no significant impacts are anticipated. Consol would transport coal from the mine area via trucks or conveyor system, either of which may be in the floodplain.

BLM's Preferred Alternative. James Creek would be protected from all development related activities unless the lessee could ensure that postmining water quality and quantity and the stability of the channel could be protected. Consol must also demonstrate that the design of the overburden stockpile in the headwaters of James Creek will not preclude existing uses of James Creek water. This may include removal of the stockpile area in the headwaters of James Creek to another site within the project area, if practical. Specifics on how to mitigate or avoid unstable slopes or soils would be developed during the mine permitting process. Because of these measures, no significant impacts would occur, and impacts should be lower than under the proposed action.

VEGETATION

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. Up to 5,200 acres of vegetation would be disturbed; however, the loss of vegetation is considered mitigatable and not significant. There would be no reclamation standard for aspen. Techniques are available that should result in successful aspen reclamation, but none have been proven locally.

BLM's Preferred Alternative. Similar to Consol's proposal. The composition of reclaimed vegetation would change slightly with more grassland. Reclamation studies and standards for aspen are included under this alternative to ensure aspen stands would be reestablished.

CULTURAL RESOURCES

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. There are no known significant impacts. There is a potential for loss of undiscovered sites of unknown significance.

BLM Preferred Alternative. Same as the Proposed Action.

PALEONTOLOGICAL RESOURCES

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. There are no known impacts. There is a potential for loss of undiscovered resources of unknown significance.

BLM's Preferred Alternative. There are no known impacts. The potential for future impacts would be reduced.

LAND USE/GRAZING

No Action/No Development Alternative. No change from current conditions would occur.

Consol's Proposed Action. There would be short-term loss of forage, but the loss is not significant since it involves changes in only one ranch operation.

BLM's Preferred Alternative. Same as Proposed Action.

RECREATION AND VISUAL RESOURCES

No Action/No Development Alternative. No change from current conditions.

Consol's Proposed Action. This proposed action would reduce the natural visual aspects adjacent to James Creek. Public hunting opportunities would be reduced.

BLM's Preferred Alternative. The impacts to visual resource values would be reduced by creating a buffer strip adjacent to James Creek. Public hunting opportunities would be maintained.

SOCIOECONOMICS

No Action/No Development Alternative. There would be increased population of up to 2,300 persons in the area.

Consol's Proposed Action. Same as No Action.

BLM's Preferred Alternative. Same as No Action.

SUMMARY OF UNSUITABILITY ANALYSIS

Coal management regulations (43 CFR 3461) require that BLM apply unsuitability criteria to lands considered for coal leasing and development. A detailed explanation of the application of unsuitability criteria and a copy of the criteria (43 CFR 3460) are found in Appendix A. If any of the criteria apply, affected portions of the lease would be declared unsuitable for all or some surface mining methods. If impacts could be avoided or satisfactorily mitigated using lease stipulations, the unsuitability criterion would allow development. Of the 20 criteria that have been applied to the PRLA, five would require mitigation for the tract to be found suitable for development. These five criteria include:

1. Two public roads bisect the PRLA, all lands within 100 feet of the right-of-way are unsuitable under Criterion #3, unless an exception applies (See Appendix A).

2. A series of rock alignments will require test excavation prior to disturbance to determine their eligibility to the National Register. This action may be necessary under Criterion #7 (Historic Land and Sites).

3. The PRLA is composed of an aggregation of habitats considered to be important in maintaining present characteristics of the main White River elk herd. Based on consultation with the Colorado Division of Wildlife, Criterion #15 (Fish and Wildlife Habitat) does not preclude mining; however, mitigation must be applied.

4. Under Criterion #16 (Floodplains), mine facilities would not be located within the 100-year floodplain of James Creek, without being designed to safely pass a 100-year, 24-hour event.

5. Criterion #19 (Alluvial Valley Floors) would require mitigation designed to protect the water supply systems to the significant agricultural land in James Creek and Good Spring Creek at the time of the mine plan. Determination of significant AVFs will be performed at the mine permit stage.

PROPOSED LAND-USE PLANNING DECISIONS

Under BLM's land-use planning decisions, three alternatives would be available: 1) no leasing or development, 2) leasing and development with specific conditions, or 3) leasing and development without special stipulation.

Under BLM's Preferred Alternative, the White River Resource Area Management Framework Plan would be changed to incorporate the following land-use decisions. (No decision has yet been made on the project area.)

Proposed decisions for the PRLA include an application of unsuitability criteria and multiple use trade offs. For the existing lease, multiple use trade offs have been made, but the proposed decision does not include the application of unsuitability criteria. Any application of these criteria will be done by OSMRE during consideration of the Permit Application Package. Development will be allowed on the PRLA (C-0126988) with the stipulations in Appendix C under BLM Preferred Alternative. The following decisions apply to the PRLA.

- No disturbance will be allowed within 100 feet of the right-of-way of Rio Blanco County Road 30 or Colorado Highway 13/789 without appropriate approval from Rio Blanco County or the state of Colorado (Unsuitability Criterion #3).

- Appropriate flood control measures (able to safely pass a 100-year, 24-hour event) will be required for development within any floodplains within the PRLA (Unsuitability Criterion #16).

- No decision on alluvial valley floors is being made at this time. It will be made during the mine permitting process (Unsuitability Criterion #19).

The proposed land use planning decision for the existing lease (C-093713) would require that all mining related development will be compensated for with 100 percent in-kind habitat value mitigation for elk and riparian/wetland habitats. Prior to any surface disturbing activities related to development of federal minerals, the lessee must demonstrate to BLM that the use of a land base adequate to accomplish this has been secured by the lessee.

CHAPTER THREE

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

CHAPTER 3—AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section focuses on the environmental impacts that would occur from development of the PRLA and adjacent Federal lease. Impacts from all alternatives have been addressed. Lesser impacts have only been summarized, and more important impacts have been discussed at length.

The Affected Environment and Environmental Consequences, as they relate to the subject, are discussed under each resource.

Significant, unavoidable adverse impacts; irreversible or irretrievable commitments of resources; or the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, if expected, are discussed in each section. If no discussion is presented, no impacts are expected.

Because the amount of coal development in the area does not depend on leasing of this PRLA, and because Consol has committed to many mitigative measures in its proposal, the leasing and development of this PRLA is not expected to contribute to any significant cumulative impacts in the project area, except in the case of water resources and economic conditions.

CLIMATE

AFFECTED ENVIRONMENT

The project area is located in a semi-arid/steppe, continental climate regime characterized by dry air, sunny days, clear nights, little precipitation, high evaporation, and large diurnal temperature changes. The region's complex topography creates considerable variation in site-specific temperature, precipitation, and surface winds. Extremely frigid conditions and blizzards can occur, but severe weather conditions such as tornadoes, floods, and damaging hail are rare.

Temperatures vary mostly with elevation, and to a lesser extent, local microclimate. Temperatures average 40 degrees F annually, with an average daily minimum of 10 degrees F in winter and an average daily maximum of 85 degrees F in summer. Precipitation amounts average 20 inches annually, with monthly totals between 1 to 2 inches. Frost-free periods occur from late June until late August a period of 40 to 65 days.

Upper-level winds predominate from the southwest, but surface wind patterns vary with local terrain and ground cover. Synoptic (pressure gradient) winds may be forced around hills or channeled through valleys, but if there are no strong gradient flows, diurnal upslope/downslope winds predominate. Detailed climatic data for this region may be found in PEDCo Environmental, Inc., (1981a) and CDM (1984a). Values reported are composites for the tract area; no on-site climate or air quality monitoring has been performed.

ENVIRONMENTAL CONSEQUENCES

There would be no significant impacts to climate from the proposed project or any alternative. The microclimate near the ground at the mine would be modified slightly until revegetation occurred. Temperatures and wind speeds would be higher over bare soil. No mitigation has been proposed.

CONCLUSION

There would be no impacts to climate.

AIR QUALITY

AFFECTED ENVIRONMENT

The existing air quality of the project area is typical of undeveloped regions in the Western United States. Ambient pollutant levels are usually near or below the measureable limits. Notable exceptions in this region include high, short-term concentrations of total suspended particulates (related to local winds) and possibly rural ozone and urban carbon monoxide. Locations vulnerable to decreasing air quality from extensive energy-related resource development, such as coal mining, include the immediate operation area and local population centers.

Current air quality regulations consist primarily of Ambient Air Quality Standards and Prevention of Significant Deterioration (PSD) increments. Ambient Air Quality

Standards limit the total amounts of specific pollutants allowed in the atmosphere. Areas that consistently violate minimum standards are classified as nonattainment areas, and a plan must be implemented to reduce ambient levels to within standards. Areas that have ambient levels within the standards, or exceed the standards due to natural sources (i.e., fugitive dust), are classified by the additional amounts of total suspended particulates and sulfur dioxide deterioration that would be allowed (PSD Class I, II, or III).

Gaseous pollutant monitoring is limited in the project area, but levels are estimated to be low and within standards. The total suspended particulate annual geometric mean concentration is estimated at 26 micrograms per cubic meter, and the 24-hour geometric mean concentration is estimated at 80 micrograms per cubic meter. Most of northwest Colorado has been designated a PSD Class II attainment area. Craig and Rangely have measured particulate levels exceeding the ambient standards. Because the cause is primarily natural dust, these towns have been designated as unclassified (USDI, BLM 1983).

ENVIRONMENTAL CONSEQUENCES

No Development Alternatives

If the PRLA and adjacent lease were not developed, there would be no contribution to air quality impacts.

Development Alternatives

Under contract to the BLM, PEDCo Environmental, Inc., developed a screening tool (the Nomograph Method for Determining Impact on TSP Concentrations Resulting From Surface Coal Mining in Colorado) to estimate potential total suspended particulate (TSP) air quality impacts from Colorado surface coal mines analyzed as part of a regional study, or as an individual mine, such as a preference-right-lease application. (PEDCo 1981b) The procedure is limited to Colorado surface coal mines which are not influenced by a major particulate source. The screening tool is based on data taken from comprehensive air quality impact studies of 29 mines, performed by PEDCo Environment for BLM. These proposed mines were located in Colorado, Wyoming, and Montana, and their coal production sizes ranged from 0.3 to 23.2 million tons per year. Detailed estimates of particulate emissions were projected by use of EPA Region VIII emission factors and the Climatological Dispersion Model. This particular screening tool is only appropriate for use in Colorado because state specific climate conditions are incorporated. The technique is biased toward overestimating impacts (worst case mine configuration, utilizing maximum TSP emissions rather than annual averages, conservative meteorologic conditions, etc.).

This evaluation assumes no interaction of other major ground level TSP sources within 2 miles and no elevated TSP sources within 6 miles of the mine (e.g., no other adjacent mines nor any major on-site processing assumed). These assumptions are appropriate since the nearest existing mine (the ColoWyo Mine) is more than 2 miles away and there are no elevated sources within the immediate vicinity of the PRLA.

When the estimated off-site TSP concentration is added to the existing concentration (nearly 26 micrograms per cubic meter in the Craig Air Basin), the James Creek Mine will remain within the Federal and Colorado annual primary ambient air quality standard of 75 micrograms per cubic meter (ug/m3) and slightly exceed the secondary ambient air quality standard of 60 ug/m3.

Air quality impacts are estimated to be:

- Off-site TSP contribution (ug/m3) - 35
- Existing off-site TSP concentration (ug/m3) - 26
- Ambient TSP concentration (ug/m3) - 61
- Annual TSP emissions (T/yr) - 3,245

These results must be considered preliminary because of the assumptions applied in the screening analysis. Further, less upward biased modeling may indicate lower potential impacts. For many years, the particulate matter standard included all size ranges of particulates (thus (TSP). Measured values were dominated by fugitive (wind blown) dust particules, which are larger than those produced in combustion processes, settle relatively quickly, and present a minimal health threat. The Environmental Protection Agency has recognized these limitations by setting new standards for particulates less than 10 microns in diameter, commonly called inhalable particulates and abbreviated PM-10. The TSP standards may be phased out over time.

Since surface coal mine TSP emissions are dominated by fugitive dust (primarily wind blown), and PM-10 concentrations are primarily due to large combustion sources, changes in the particulate standards do not alter the air quality impact analysis conclusions. No mitigation has been proposed.

Conclusion

Development is predicted to slightly exceed the secondary annual total suspended particulate ambient air quality standard.

Colorado's Department of Health Air Quality Control Division would examine potential impacts from the proposed mine when applications were made for the necessary construction/operation permits. Standard lease stipulations would include strict adherence to all applicable state and Federal statutes, laws, and regulations. Long-term postmining impacts on local air quality would be negligible.

SOILS

AFFECTED ENVIRONMENT

Dominant soils within this area include Owen Creek, Jerry, Burnette, Silas Variant, Rhone, Northwater, Lamphier, and Mergel. They are typical of mountainous areas in northwest Colorado (CDM 1984a). There are no prime farmlands within the boundaries of the PRLA (SCS 1982b). Detailed descriptions of these soils and the soil mapping units are available in the Rio Blanco County Soil Survey (USDA, SCS 1982a) and the Environmental Report, Meeker PRLA, and adjacent Federal Leases (CDM 1984a) contain additional information.

These dominant soils have a wide range of chemical and physical properties, as shown in Table 3-1. The majority of the soils within the PRLA and adjacent lease areas are found on mountain ridges, side-slopes, and valley sides. Soil depths range from less than 20 inches to greater than 60 inches. Textures of the surface horizons include loam, clay loam, and silty clay loam, while textures of the subsurface horizons vary from fine sandy loam to clay. These horizons contain from less than 10 percent to greater than 65 percent, by volume, of coarse fragments (CDM 1984a and USDA, SCS 1982a). These soils developed under an estimated average annual precipitation of 8 to 25 inches and a variety of parent materials, including residuum of sandstone, marine shale, calcareous shales, or in alluvial/colluvial materials.

A measure of soil productivity is the average annual productivity expressed in pounds per acre of air dry vegetation per year. This value varies from approximately 100 to 2,500 lbs for the soils in this area (USDA, SCS 1982a).

Factors that influence production are availability of plant nutrients, effective moisture, soil reaction, salt content, seasonal high water table, past and present erosion, soil texture, soil depth, and position on the landform. The most limiting factors for the soils are low moisture at lower elevations, shallow soil depths along ridges, and abbreviated frost-free periods at higher elevations. The existing data on productivity for these soils includes generalized groupings of soil reaction, electrical conductivity, sodium adsorption ratio, and organic matter content. Another concern is the low levels of phosphorous and nitrogen (EMRIA Report No. 23, 1976).

Soil stability depends on environmental and management variables and the rate of natural or accelerated erosion. The hazard of water erosion within the area varies from slight (on gently sloping areas) to very high (on steeper slopes, Table 3-1). Other factors that influence soil stability are kind, intensity, and area of surface-disturbing activities. The surface hazard from water erosion in most of this area ranges from moderate to very high. The underlying geological structure also influences the low stability of slopes, as indicated by the large number of natural landslides.

ENVIRONMENTAL CONSEQUENCES

No Development Alternatives

Existing natural systems would remain. Projects to correct existing water quality and or soil stability problems would be small scale. Under this alternative, present rates of erosion would continue.

Development Alternatives

Impacts might include increased erosion and the loss of soil stability and productivity, particularly in stockpile

TABLE 3-2
THE POSSIBLE EFFECTS OF MINING ACTIVITIES
ON SELECTED SOIL PROPERTIES

Selected Natural Soil Properties*	Possible Effects
Soil structure	Destroyed
Permeability rate	Reduced
Infiltration rate	Reduced
Soil horizons	Destroyed
Number & diversity of soil organisms	Decreased
Nutrient energy cycles	Destroyed
Stability	Decreased
Erosion potential	Increased
Depth	Altered
Texture	Altered
Waterholding capacity	Altered
Soil color	Altered
Native vegetative cover	Removed

*All these properties will exist after mining, but present natural conditions will no longer exist.

Table 3-1 Characteristics of Selected SoilsWithin the Area

Soil Map Unit	Map Symbol	Position on the Landscape	Approx. Depth to Bedrock	Surface/Subsurface Textures[2]	Percentage by Volume Rock . Fragments	pH Range
Jerry-Thornburgh-Rhone complex, 8-65% slopes	45	Mountainsides, ridges, and side slopes				
Jerry			5.0	L/Chan.CL	0-35	6.6-8.4
Thornburgh			5.0	Chan.L/Chan.L	0-65	6.6-7.8
Rhone			4.0	L/V Chan L.	0-65	6.6-7.8
Mergel-Redthayne-Dollard complex, 8-65% slopes	51	Mountainsides, hill toe slopes, and ridges				
Mergel			5.0	Chan. CL/V Chan L	15-60	7.4-8.4
Redthayne			5.0	Chan L/C Chan L	15-60	6.6-9.0
Dollard			2.0	SiCL/SiCL	0-5	7.4-9.0
Owen Creek-Jerry Burnette* loams, 5-35% slopes	57	Hillcrests, ridges, and mountainsides				
Owen Creek			2.0	L/CL	0-10	6.6-8.4
Jerry			5.0	L/Chan.CL	0-35	6.6-8.4
Burnette*			5.0	L/C	0-15	6.1-8.4
Rhone-Northwater-Lamphier loams, 3-50% slopes	77	Mountainsides and valley slopes				
Rhone			4.0	L/V Chan.L	0-60	6.6-7.8
Northwater			4.0	L/L,V.Chan SCL, V Chan L	10-65	6.6-7.8
Lamphier			5.0	L/ L/L	15	6.6-7.8
Shawa loam, slopes	80	Alluvial valley floors, lower terraces, and along concave drain ways	5.0	L/CL/CL,fSL,CL,grL	0.10	6.6-7.8
Silas loam, 0-8% slopes	82	Bottom of narrow mtn. valleys	5.0	L/L, SCL	5-15	6.6-7.8
Silas variant loam	84	Alluvial valley floors, fans, swales and terraces	5.0	L/L, S.CL, CL	0-10	7.4-9.4
Torriorthents-Rock Out-Crop complex, 15-90% slopes	91	Extremely rough and eroded areas on mountains, hills ridges and canyonlands	var.	Chan L./Chan L,	var	var
Torriorthents						
Rock Outcrop			0.0			
Waybe-Vandemere Rock Outcrop complex, 0--30%	98	Side slopes, narrow ridgetops				
Waybe			1.5	Flaggy Cl/C; Chan	15-25	7.4-8.4
Vandamore Variant			3.0	SiCl, Chan L/V Chan L,	10-65	7.4-8.4
Rock Outcrop			0.0			

[1] The information in this Table was taken from (CDM 1984a) and (SCS 1982a).

[2] L=Loamy, CHAN=Channery, V=Very, S.CL=Silty Clay Loam, SCL=Sandy Clay Loam, CL=Clay Loam, C=Clay, gr=gravelley.

[3] Hazard to Water Erosion SL=Slight, M-Moderate, H=High, V.H. Very High

Weighted Topsoil Stripping Depth (ft)	Total Acreage	Topsoil Volumes (acre/ft)	Range of Permeability Surface/Subsurface (in/hr)	Hazard [3] Water Erosion	Range Site Name[5]	Percentage Organic Matter (%)
2.9	262	759.8				
			0.6-2	M to V.H.	Brush Loam (2,500)	3-5
			0.6-2.0/2.-6.0	SL to V.H.		2-4
			0.6-2.0	MOD to V.H.		3-6
0	46	0				
			0.6-2.0	H to V.H.	Loamy Slopes (1,000)	2-4
			0.6-2.0	H. to V.H.	Loamy Slopes	1-3
			0.06-0.2	MOD to V.H.	Clayey Foothills	1-2
2.2	3509	7719.8				
			0.06-2.0/.06-.2	MOD to H	Brushy Loam (2,000)	2-3
			0.6-2.0	MOD to V.H.		3-5
			0.6-2.0/.06-0.2	MOD to H		3-6
2.4	499	1197.6				
			0.6-2.0	SL to V.H.	Brush Loam (2,250)	3-6
			0.6-2.0	SL to V.H.	Aspen Woodland Site	3-6
			0.6-2.0	M to H	Aspen Woodland Site	2-4
5.0	23	115	0.6-2.0	SL to M	Deep Loam (1,200)	2-4
5.0	128	640	0.6-2.0	SL to M	Mountain Swale	1-3
5.0	130	65	0.6-2.0/.2-6	SL	Mountain Swale (2,500)	2-6
0	161	0				
			----	VH	Stony Foothills (100)	100

0	557	0				
			0.2-0.6.06-0.2	M. to H.	Dry Exposure (350)	---
			0.6-2/2.0-6.0	M		1

---

[4] All Soil Map Units, except for Units 91 and 98, have Electrical Conductivities (EC's) of less than 2 mmho/cm and Sodium Absorption Ratios (SAR's) of less than 8. Unit 91's EC and SAR are considered to be variable, while Unit 98 has a EC of less than 4 and a SAR of less than 8.

[5] Numbers in parenthesis are production in lbs/acre.

areas. These would be caused by vegetation and soil removal and the handling, stockpiling, and redistribution of the soil material. The major concern would be reduction of existing productivity of soils which currently support aspen. These soils have higher organic matter contents, water holding capacity, and pH than adjacent soils (Baker 1925, Morgan 1969, Sheppard 1983, and Tew 1968). These activities would destroy or alter almost all soil properties.

Possible impacts on the existing soil system are presented in Table 3-2. Impacts would be gradually reversed, after the vegetation and an environmental balance have been established.

Under the Preferred Alternative, impacts would be reduced through the special handling of aspen soils, or other techniques identified by BLM or through incorporation of the aspen reclamation study results before development.

More detailed information about these impacts on the soil resource are available at the Craig District Office (Fisher 1983, Hargis 1984, BLM 1980, BLM 1983, and USDI 1976).

Mining would alter the soil profile. This altered condition would exist until the new soil achieved a balance with the environment. The reconstructed soils would be more uniform and less diversified than the existing soils.

Any soil loss and destruction of the natural soil profile would be irreversible. Regulations requiring the same, or improved, productivity that existed before mining would mitigate impacts to soils, except for the destruction of the soil profile.

Conclusion

Short-term impacts to soils would be minor if mitigation in Office of Surface Mining Reclamation and Enforcement (OSMRE) and Colorado Mine Land Reclamation Division (CMLRD) regulations were strictly enforced. Potential long-term impacts are unknown but should be minimal because of the reclamation program.

RECLAMATION

Calculations based on preliminary data of topsoil depths and volumes indicate that sufficient material is available to reclaim disturbed areas to a depth of approximately 2 feet within the PRLA and 1.6 to 2.8 feet within the adjacent Federal lease areas (CDM 1984a).

Soils under established aspen stands are different than soils in the adjacent areas (higher moisture holding capacity, higher productivity and organic matter content, darker color, and more depth). Aspen exist on the more productive soils with higher moisture content and greater depth, which are the only two factors that can be replaced economically during reclamation.

Because predisturbed soils under aspen sites are greater than 40 inches, a 2.5 foot replacement requirement, rather than the 2.0-foot one, would make a difference of 20 percent in soil depth and moisture.

In the past, reclamation practices have not been successful in producing healthy aspen stands on reclaimed areas because the water holding capacity of the natural soil system was not reproduced, which is the key factor in successfully reproducing aspen. This added 6 inches of soil, therefore, is an important element in the water holding capacity of the soil.

Anticipated problems associated with infiltration, compaction, and erosion must be considered if these materials are to be used as topsoil. Other problems include the impact on water quality and water quantity, landsliding (or slope stability), wildlife habitat, and postmining use and condition. For a complete discussion of possible reclamation practices see Appendices D and E. The reclamation proposal made by Consol incorporates combinations of techniques that are not currently practiced in northwest Colorado. BLM specialists believe that these techniques should prove to be successful. The biggest obstacle that is expected to be encountered is reclaiming aspen on a widespread basis; however, careful planning and implementation, with an emphasis on duplicating the ecological conditions that existed prior to mining, should result in a successful reclamation effort.

ALLUVIAL VALLEY FLOORS (AVF)

Preliminary AVF classifications are recommended for the specially managed subirrigated lands located on unconsolidated stream-laid deposits in sections 15 and 22, T. 3 N., R. 93 W., and section 9, T. 2 N., R. 93 W., all of which are located outside the study area. The significance of the areas that are being recommended as AVFs will be determined at the mine plan stage.

AFFECTED ENVIRONMENT

Federal and state regulations require identification of alluvial valley floors (AVFs) that might be affected by mining, based on guidelines published by OSMRE and CMLRD (43 CFR 3461.1 1984), OSMRE 1983), CMLRD (1980)). The intent of these regulations is to protect AVFs located within and near the mined area.

CMLRD regulations state that an AVF exists if:

1. Unconsolidated stream-laid deposits holding streams are present; and

2. There is sufficient water to support agricultural activities, as evidenced by:

The existence of flood irrigation in the area or its historical use;

The capability of the area to be flood irrigated, based on stream-flow water yield, soils, water quality, topography, and regional practices; or

Subirrigation of the area, derived from the groundwater system of the valley floor. (CMLRD 1980, 2.06.8).

OSMRE guidelines define an AVF as follows:

1. A topographic valley with a continuous perennial, intermittent, or ephemeral stream channel running through it. This valley must contain:

Surface landforms that are either floodplains or terraces, if these landforms are underlain by unconsolidated deposits; and

Side-slope areas that can reasonably be shown to be underlain by alluvium and that are adjacent to floodplain or terrace landform areas.

2. Water is available by surface-water irrigation or subirrigation and is being or has been successfully used to enhance production of agriculturally useful vegetation, or surface water is available in sufficient quantities to support agricultural activities (OSMRE 1983, II-7 to II-11).

Once an alluvial valley floor has been identified using the above criteria, a determination must be made whether the AVF is "significant" or "insignificant." If it is undeveloped rangeland that is relatively unimportant to farming operations, or if the amount of disturbed acreage is small and provides or may provide negligible support for production of one or more farming operations, the AVF is "insignificant" (OSMRE, I-8, 1983; CMLRD, 2.06.8, 1980). Past and present land uses and management practices within and adjacent to the affected alluvial valley provide information regarding the significance of an AVF. Restrictions that would be placed on significant AVFs are described in Appendix A.

The following are preliminary recommendations regarding AVF classifications in the project area. Final AVF classifications will be performed at the mine plan stage.

James Creek

Subirrigated unconsolidated stream-laid deposits comprise a strip varying from 60 to 300 feet wide in the valley bottom (Map 3-1) (CDM 1984a).

Groundwater monitoring data, soil moisture, vegetation rooting depth, soil mottling, and the water requirements of the resident vegetation indicate that the James Creek valley floor is subirrigated. The subirrigated vegetation includes giant wildrye, brome species, bluegrass species, sedge species, and rush species, which are considered to be agriculturally useful. (CDM 1984a, BLM 1985). Also present is scrub willow. The probable extent of subirrigation is presented in map 3-1 (CDM 1984a).

There is no evidence of historical or recent flood irrigation within and immediately adjacent to the PRLA and lease C-093713 (CDM 1984a). Adjudicated water rights exist on the AQ No. 1 Ditch and AQ No. 1 Ditch headgate #1 in the SE 1/4NW 1/4 section 11, T. 3 N., R. 93 W., at the mouth of the James Creek (Colorado Division of Water Resources 1984, 1985).

Surface water also appears to be available in sufficient quantities to support agricultural activities (CDM 1984a).

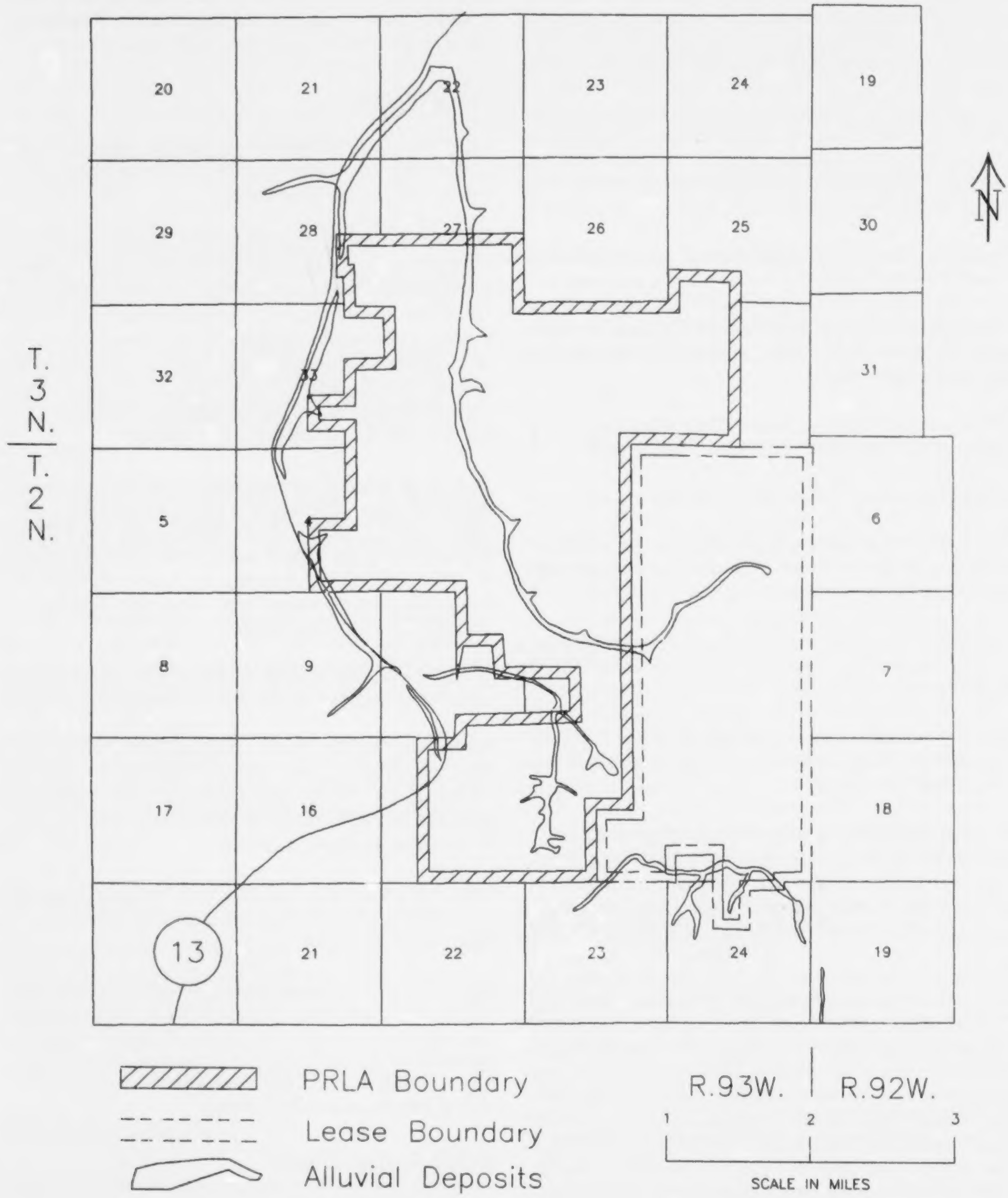
Monitoring data obtained in 1983 and 1984 indicate that the average total dissolved solids (TDS) concentration is approximately 750 mg/l (CDM 1984a). This value suggests that the water quality of James Creek is not limiting for certain agricultural activities.

The soil within the James Creek valley bottom is predominately Silas Variant and is rated as suitable for irrigation (CDM 1984a).

The James Creek alluvial valley within the PRLA is used by landowners and lessees primarily for livestock grazing. Outside the PRLA, near the mouth of James Creek, an approximate 10-acre subirrigated pasture and hay field exists. Brush removal and weed control occurs in and around the 10 acres (CDM 1984a).

Good Spring Creek

Preliminary AVF classifications are recommended for the 10-acre smooth brome pasture in section 9, T. 2 N., R. 93 W., and the flood irrigated hay/pasture in section 15, T. 3 N., R. 93 W., both of which are outside the project area. Also, the state of Colorado has determined that significant AVFs are present in sections 11 and 14 of T. 3 N., R. 93 W. The subirrigated and improved land in section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22
23
24
19
PRLA Boundary
Lease Boundary
Alluvial Deposits
R.93W.
R.92W.
1
2
3
SCALE IN MILES

Map 3-1 Potentially Significant Alluvial Valley Floors

14, T. 2 N., R. 93 W., is on colluvial slopewash materials, not alluvium (CDM 1984a), and therefore does not meet OSMRE's and CMLRD's requirements.

The extent of unconsolidated stream-laid deposits and subirrigated land is delineated on Map 3-1 (CDM 1984a).

Vegetative species composition, shallow water tables, and soil mottling indicate subirrigation in the valley bottom of Good Spring Creek within and outside of the PRLA and lease C-093713. The probable extent of subirrigation is presented in Map 3-1 (CDM 1984a).

There is no evidence of historical or recent flood irrigation along Good Spring Creek within the PRLA (CDM 1984a). Water rights have been adjudicated for several ditches near the PRLA. Specifically these irrigation ditches are:

Freund Ditch #2 SE1/4SW1/4 section 33, T. 3 N., R. 93W.

Freund Ditch #3 NW1/4SE1/4 section 33, T. 3 N., R. 93 W.

Freund Ditch #4 NW1/4SE1/4, section 33, T. 3 N., R. 93 W.

AQ Ditch SE1/4SE1/4 section 21, T. 3 N., R. 93 W.

AQ No. 1 Ditch HGT 2 SW1/4SE1/4 section 15, T. 3 N., R 93 W.

AQ No. 1 Ditch HGT 3 SE1/4SE1/4 section 15, T. 3 N., R. 93 W.

AQ No. 2 Suppl. HGT NE1/4SW1/4 section 14, T. 3 N., R. 93 W.

AQ No 2 Ditch NE1/4SW1/4 section 14, T. 3 N., R. 93 W.

(Colorado Division of Water Resources 1984, 1985).

Surface water is present in sufficient quantities to support agricultural activities (CDM 1984a).

Monitoring data obtained in 1983 and 1984 indicate TDS values ranging from approximately 382 mg/l to 908 mg/l (CDM 1984a, Hem 1970). These values suggest that the water quality of Good Spring Creek is not limiting to certain agricultural activities.

The soils within the Good Spring Creek valley bottom include both Silas Variant and Silas loam. The Silas Variant occurs in lower Good Spring Creek (approximately downstream from the SE1/4 section 4, T. 2 N., R. 93 W.), and is rated as suitable for irrigation. The Silas loam occurs in the upper Good Spring Creek valley bottoms and is generally unsuitable for irrigation (CDM 1984a, SCS 1982).

The portions of the Good Spring Creek watershed within the PRLA are used by the landowners and lessees primarily for livestock grazing. Introduced, improved grasses are located in the northern half of section 14, T. 2 N., R. 93 W. A 10-acre (approximate) smooth brome pasture is located where Good Spring Creek crosses the eastern boundary of section 9, T. 2 N., R. 93 W. (CDM 1984a). Most of the valley floor of Good Spring Creek from the James Creek confluence to the Elkhorn Creek confluence is used for hay production (Walsh 1984).

Ninemile Draw

The combination of unconsolidated stream-laid deposits and subirrigation is mainly confined to that portion of Ninemile Draw located in section 13 and section 24 of T. 2 N., R. 93 W. (Map 3-1) (CDM 1984a).

Silas loam is the predominate soil present in the Ninemile Draw Valley in lease C-093713, and this soil is considered generally unsuitable for irrigation (CDM 1984a, SCS 1982).
There are no flood irrigation activities (CDM 1984a) or adjudicated water rights for ditch diversion within lease C-093713 (Colorado Division of Water Resources 1984 1985).

Livestock grazing is the dominant use of the portions of the Ninemile Draw watershed encompassed by the PRLA and Federal Lease C-093713.

ENVIRONMENTAL CONSEQUENCES

No Development Alternatives.

If no development occurs, AVF determination would not take place and no impacts to AVF would occur.

Development Alternatives.

OSMRE and CMLRD regulations prohibit, under most circumstances, mining operations if the proposed activities interrupt, discontinue, or preclude farming, unless the premining land use has been undeveloped range that is not significant to farming or unless the area is small and provides, or may provide, negligible support farming operations. Land management practices (based on regional practices) provide information on the relative importance of an alluvial valley to a farming operation.

The BLM does not have access to farm and ranch financial data in the area and therefore cannot determine the agricultural significance of these areas. Final determination of AVF status will be made at the mine plan stage.

Preliminary AVF recommendations based on hydrologic, geologic and management factors are as follows.

James Creek

The 10-acre (approximate) pasture in section 22, T. 3 N., R. 93 W., at the mouth of James Creek is recommended for consideration as an AVF for the following reasons:

1. The area fulfills the geologic criteria of an AVF.

2. The area is subirrigated.

3. The presence of the AQ No. 1 ditch indicates surface irrigation, and this is a regionally practiced form of land management.

4. The resident vegetation is agriculturally useful and highly productive.

5. Brush removal and weed control practices indicate that the area is agriculturally important to ranch operations.

Although this area is outside of the PRLA (approximately 1 1/4 miles downstream), alteration of the James Creek hydrologic regime and elevated levels of total dissolved solids during and after mining may impact this area.

The remainder of the James Creek Valley does not appear to fulfill OSMRE and CMLRD criteria and is not recommended for AVF designation.

Good Spring Creek

The state of Colorado has determined that significant AVFs are present in sections 11 and 14, T. 3 N., R. 93 W. (CMLRD 1984). In addition, the valley floors in sections 15 and 22, T. 3 N., R. 93 W., are recommended for consideration as AVFs for the following reasons:

1. The valley floors fulfill the geologic criteria of an AVF.

2. The areas are subirrigated.

3. The presence of the AQD No. 1 Ditch headgates #2 and #3 and James Pipeline indicate surface irrigation, and this is a regionally practiced form of land management.

4. The resident vegetation is agriculturally useful and highly productive.

5. Hay production practices indicate that the areas are agriculturally important to ranch operatons.

These areas are all located outside of the PRLA. The valley floors downstream from the confluence of James and Good Spring creeks, however, may be impacted from the alteration of the James Creek hydrologic regime and increased levels of total dissolved solids. In addition, the construction and use of a rail spur may adversely affect the productivity of the Good Spring Creek valley floor.

The 10-acre smooth brome pasture in section 9, T. 3 N., R. 93 W., may meet OSMRE and CMLRD criteria for AVF designation. However, no recommendations are presented in this document, as these areas probably would not be significantly influenced by the proposed coal operation.

The subirrigated and improved land in the PRLA in section 14, T. 2 N., R. 93 W., is on colluvial slopewash materials, not alluvium (CDM 1984a), and does not meet the OSMRE and CMLRD requirements. The remainder of the Good Spring Creek valleys in the PRLA are also not located on alluvium.

Ninemile Draw

The portions of the Ninemile Draw valley within lease C-093713 do not meet OSMRE and CMLRD AVF criteria. In addition, the Ninemile Draw valley floor would not be significantly influenced by the proposed coal operation.

Conclusion

Preliminary AVF classifications are recommended for the Good Spring Creek valley floors in sections 15 and 22, T. 3 N., R. 93 W. In addition, a preliminary AVF classification is recommended for the James Creek valley floor in the NW1/4 of section 22, T. 3 N., R. 93 W. These lands, in addition to the state designated AVFs in sections 11 and 14, T. 3 N., R. 93 W., may be impacted by the proposed coal operation.

The importance of these lands to agricultural activities will be determined at the mine plan stage.

SURFACE WATER

Alteration of the hydrologic regime of James Creek would result in earlier and lower peak flows, increased runoff, and higher base flows after reclamation.

Present channel morphology for portions of James Creek, Elkhorn Creek, Little Creek, and Good Spring Creek would be altered.

Surface water quality would be altered. Spoils aquifer water contributions to surface water systems would increase total dissolved solid values on-site and off-site. Increased total suspended solid values are expected on-site in the James Creek, Good Spring Creek, Elkhorn Creek, and Little Creek watersheds during the mining and reclamation phases. Total suspended solid values should not significantly increase off-site.

AFFECTED ENVIRONMENT

The PRLA and the adjacent Federal lease C-093713 include portions of the watersheds of James Creek, Good Spring Creek, Curtis Creek, Ninemile Draw, Elkhorn Creek, and Little Creek.

James Creek

James Creek is the principal stream course draining the PRLA. The total drainage basin area is 7.13 square miles, 81 percent of which is included in the PRLA and lease C-093713 (CDM 1984a). The total drainage area within the PRLA is 3.84 square miles, or 48 percent of the total PRLA area (CDM 1984a).

James Creek flows in a north-northwest direction to its confluence with Good Spring Creek. The watershed is characterized by a broad, undulatory upland area, steep valley side slopes, and a narrow, relatively flat-floored valley bottom.

Excessive flows resulting from the above average accumulation of snowpack, unusually rapid spring snowmelt and intense thunderstorms in 1984, deeply incised portions of the James Creek channel.

During 1983 field inspections, the channel segments were relatively stable, with widths averaging 10 to 15 feet and depths from 2 to 5 feet. Channel conditions were heavily influenced by the abundance of beaver dams and the resultant accumulation of sediment, ponds, and reduction of peak flows (CDM 1984a). The excessive flooding in 1984 breached some beaver dams, and altered the existing sediment aggregation/degradation patterns.

Water quality monitoring was performed at 15 stations at James Creek during June and November 1983 and at one station during May and October 1984. Like the watersheds in this area, the water is a calcium-bicarbonate type during the spring runoff period and a magnesium-sulfate type during fall's low-flow period (CDM 1984a). Conductivity values in 1983 ranged from 450 to 1,905 micromhos/cm (umhos), which indicate total dissolved solid concentrations between 250 to 1,430 mg/l (Hem 1970). The total dissolved solid concentrations measured at the northern boundary of the PRLA in 1984 averaged 360 mg/l (CDM 1984a).
Estimated flows at the northern boundary of the PRLA in 1983 ranged from 0.13 (November) to 6.0 (July) cfs. Measured flows in 1984 ranged from 1.5 (October) to 12.2 (May) cfs (CDM 1984a).

The Colorado Division of Water Resources has established stream classifications and water quality standards for certain waters, including James Creek. The water quality-use classifications for James Creek are: Recreation, Class 2; Cold Water Aquatic Life, Class II; and Agriculture.

James Creek water in the PRLA and federal lease C-093713 is primarily used for stock and wildlife watering. An adjudicated water right exists for the AQ No. 1 Ditch located in the SE1/4NW1/4 of section 22, T. 3 N., R. 93 W., approximately 1 1/2 miles north (downstream) from the PRLA. The water is decreed for irrigation purposes (CDWR 1985, CDWR 1984). Additional water rights information is presented in Table 3-3 and Map 3-2.

Good Spring Creek

The Good Spring Creek watershed area is approximately 35 square miles, with about 8.3 percent of watershed within the PRLA. Approximately 2.73 square miles are within the PRLA, or 34 percent of the total PRLA area is occupied by the Good Spring Creek watershed (CDM 1984a). The Good Spring Creek watershed drains the western and southern portions of the PRLA and is tributary to Milk Creek, a tributary of the Yampa River.

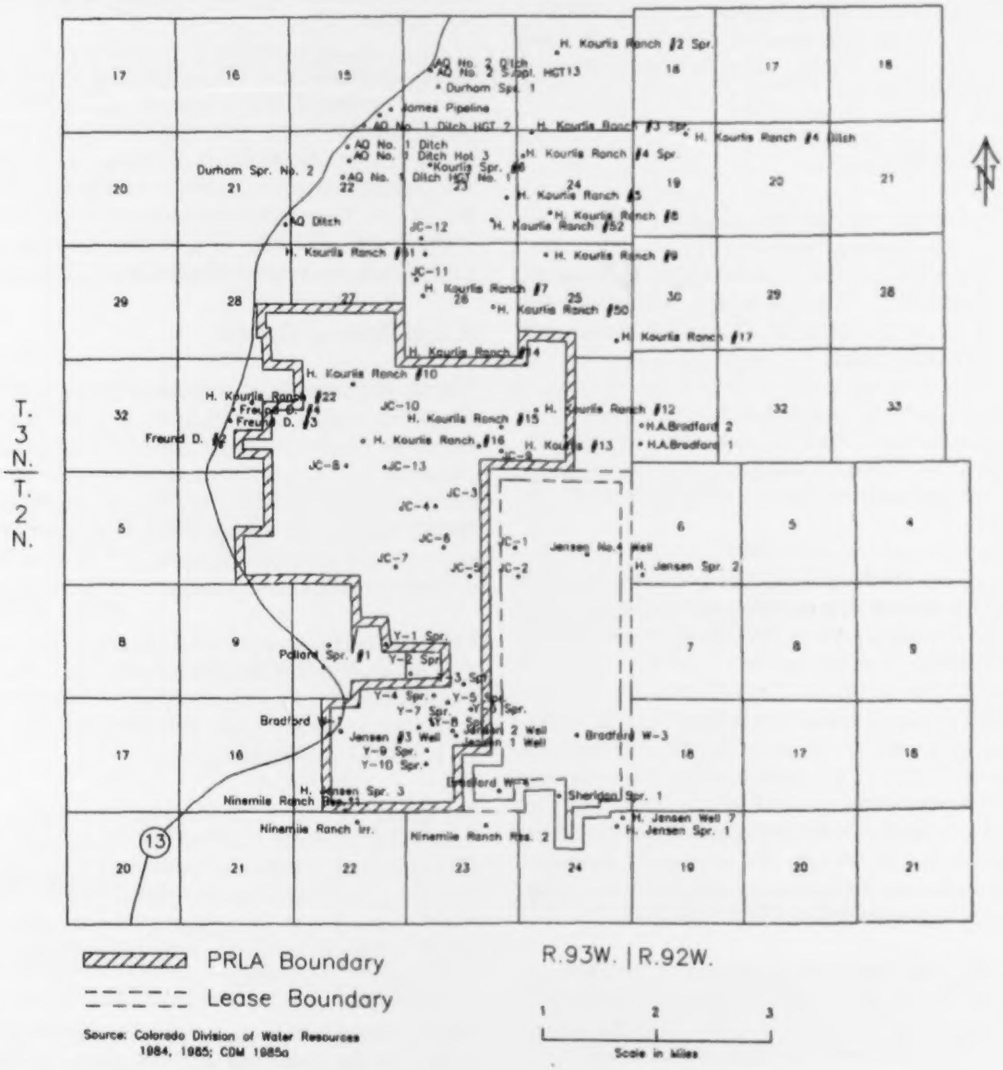
The watershed is geomorphically characterized by a gently, undulatory upland area, steep side slopes downstream from the headwaters, and a flat floored valley. The headwaters are broad and open, with wide, flat, marshy channels, and frequent natural ponds.

The spring flooding of 1984 had less of an impact on Good Spring Creek than on James Creek. Some sedimentation did occur in areas naturally conducive to aggregation, but Good Spring Creek is geomorphically more stable than James Creek. Good Spring Creek's confluence with Milk Creek is approximately 10 miles downstream from the northern PRLA boundary.

Water quality information available for Good Spring Creek includes data from a USGS station at Axial (discontinued in 1977 and approximately 5 miles downstream from the PRLA boundary) and data from field investigations conducted in 1983 and 1984 near the periphery of

TABLE 3-3
JAMES CREEK WATERSHED - ADJUDICATED WATER RIGHTS WITHIN AND NEAR PRLA AND FEDERAL LEASE C-093713

Name	Location	Use	Amount (cfs)
Helen Jensen Spr. 2	SW1/4SW1/4 sec. 6, T. 2 N., R. 92 W. (near study area)	irrigation, stock, domestic	0.02
Jensen No. 4 Well	SW1/4SE1/4 sec. 1, T. 2 N., R. 93 W. (lease 093713)	stock, combination	0.013
AQ No. 1 Ditch	SE1/4NW1/4 sec. 22, T. 3 N., R. 93 W. (near study area)	irrigation	5.30
AQ No. 1 Ditch HGT No. 1	SE1/4NW1/4 sec. 22, T. 3 N., R. 93 W. (near study area)	irrigation	1.80
H Kourlis Ranch #7 Spr.	SW1/4NW1/4 sec. 26, T. 3 N., R. 93 W. (near study area)	stock	0.01
H Kourlis Ranch #51 Spr.	NW1/4NW1/4 sec. 26, T. 3 N., R. 93 W. (near study area)	stock	0.033
H Kourlis Ranch #14 Spr.	SE1/4SW1/4 sec. 26, T. 3 N., R. 93 W. (near study area)	stock	0.03
H Kourlis Ranch #10 Spr.	NW1/4NE1/4 sec. 34, T. 3 N., R. 93 W. (in PRLA)	stock, irrigation	0.70
H Kourlis Ranch #11 Spr.	NE1/4SE1/4 sec. 34, T. 3 N., R. 93 W. (in PRLA)	stock	0.04
H Kourlis Ranch #15 Spr.	NE1/4SE1/4 sec. 35, T. 3 N., P. 93 W. (in PRLA)	stock, domestic	0.03
H Kourlis Ranch #16 Spr.	SW1/4SE1/4 sec. 35, T. 3 N., R. 93 W. (in PRLA)	stock	0.10


T. 3 N.
T. 2 N.
N
H. Kourlis Ranch #2 Spr.
AQ No. 2 Ditch
AQ No. 2 S.Appl. HGT13
Durhom Spr. 1
James Pipeline
AQ No. 1 Ditch HGT 2
H. Kourlis Ranch #3 Spr.
H. Kourlis Ranch #4 Ditch
AQ No. 1 Ditch
AQ No. 1 Ditch Hgt 3
Kourlis Spr. #6
H. Kourlis Ranch #4 Spr.
Durhom Spr. No. 2
AQ No. 1 Ditch HGT No. 1
H. Kourlis Ranch #5
H. Kourlis Ranch #8
H. Kourlis Ranch #52
AQ Ditch
JC-12
H. Kourlis Ranch #51
H. Kourlis Ranch #9
JC-11
H. Kourlis Ranch #7
H. Kourlis Ranch #50
H. Kourlis Ranch #17
H. Kourlis Ranch #14
H. Kourlis Ranch #10
H. Kourlis Ranch #22
Freund D. #4
Freund D. #3
Freund D. #2
JC-10
H. Kourlis Ranch #15
H. Kourlis Ranch #12
H.A.Bradford 2
H.A.Bradford 1
H. Kourlis Ranch #16
H. Kourlis #13
JC-9
JC-8
JC-13
JC-3
JC-4
JC-6
JC-1
Jensen No.4 Well
H. Jensen Spr. 2
JC-7
JC-5
JC-2
Y-1 Spr.
Pollard Spr. #1
Y-2 Spr.
Y-3 Spr.
Y-4 Spr.
Y-5 Spr.
Y-6 Spr.
Y-7 Spr.
Y-8 Spr.
Bradford W-1
Jensen #3 Well
Jensen 2 Well
Jensen 1 Well
Bradford W-3
Y-9 Spr.
Y-10 Spr.
Bradford W-4
H. Jensen Spr. 3
Sheridan Spr. 1
Ninemile Ranch Res. 1
H. Jensen Well 7
H. Jensen Spr. 1
Ninemile Ranch Irr.
Ninemile Ranch Res. 2
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23
24
19
29
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27
26
25
30
32
33
5
6
4
8
9
7
R.93W. | R.92W.
PRLA Boundary
Lease Boundary
1
2
3
Scale in Miles

Source: Colorado Division of Water Resources 1984, 1985; CDM 1985a

Map 3-2 Adjudicated Water Rights

the PRLA. Sampling results indicate that the water is magnesium-sulfate type.

Conductivity values resulting from the 1983 and 1984 field monitoring varied from 695 to 1,290 umhos/cm, which indicates total dissolved solid (TDS) values between 380 to 910 mg/l (Hem 1970)(CDM 1984a). TDS values recorded at USGS station 09250400 in water year 1976 ranged from 912 (July 1976) to 1,080 mg/l (May 1976) (USGS 1977).

Flows recorded during the field monitoring ranged from 1.84 (August 1984) to 27.4 (May 1984) cfs. Average 24-hour discharge values recorded at USGS station 09250400 in water year 1976 ranged from 0.44 (September 1976) to 3.3 cfs (April 1976) (USGS 1977).

The water quality use classifications for Good Spring Creek are: Recreation, Class II; Warm Water Aquatic life, Class II; and Agriculture.

Water from Good Spring Creek is primarily used for irrigation, stock, and wildlife purposes. Adjudicated water rights on sources located within or near the Good Spring Creek watershed are listed in Table 3-4 and shown on Map 3-2.

Curtis Creek

The Curtis Creek watershed encompasses approximately 16.5 square miles. Approximately 3.5 percent of the total watershed is contained within the PRLA. The watershed area within the PRLA is 0.59 square miles, or 7.4 percent of the total PRLA area (CDM 1984a). The Curtis Creek watershed drains the extreme southwestern corner of the PRLA. Curtis Creek flows in a southwesterly direction and eventually empties into the White River, about 1 mile east of Meeker.

The PRLA encompasses a portion of the upland areas of Curtis Creek. The areas are characterized by flat, marshy channels with gentle gradients and natural ponds.

TABLE 3-4
GOOD SPRING CREEK WATERSHED - ADJUDICATED WATER RIGHTS WITHIN AND NEAR PRLA AND FEDERAL LEASE C-093713

Name	Location	Use	Amount (cfs)*
Y-1 Spr.	NE1/4SE1/4 sec. 10, T. 2 N., R. 93 W. (near study area)	domestic, stock	0.033
Pollard Spr. #1	NW1/4SW1/4 sec. 10, T. 2 N., R. 93 W.(near study area)	domestic, stock	0.013
Y-4 Spr.	SW1/4SW1/4 sec. 11, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Y-2 Spr.	NW1/4SW1/4 sec. 11, T. 2 N., R. 93 W. (near study area)	domestic, stock	0.033
Y-10 Spr.	NW1/4SW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Y-9 Spr.	SW1/4NW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Y-8 Spr.	NW1/4NW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Y-7 Spr.	NW1/4NW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Y-5 Spr.	NE1/4NW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Y-6 Spr.	NW1/4NE1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Jensen No. 2 Well	SW1/4NW1/4 sec. 14, T. 2 N., R.93 W. (in PRLA)	irrigation, domestic, stock	1.34
Jensen No. 3 Well	SW1/4NW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	irrigation, domestic, stock	0.013
Jensen No. 1 Well	SE1/4NW1/4 sec. 14, T. 2 N., R. 93 W. (in PRLA)	irrigation, domestic, stock	0.013
Durham Spr. 1	NE1/4SW1/4 sec. 14, T. 3 N., R. 93 W. (near study area)	domestic, stock	0.11
AQ No. 2 Ditch	NE1/4SW1/4 sec. 14, T. 3 N., R. 93 W. (near study area)	irrigation	9.5
AQ No. 2 Suppl. Hgt	NE1/4SW1/4 sec. 14, T. 3 N., R. 93 W. (near study area)	irrigation	4.2
AQ No. 1 Ditch Hgt 3	SE1/4SE1/4 Sec. 15, T. 3 N., R. 93 W.	irrigation	8.2
AQ No. 1 Ditch Hgt 2	SW1/4SE1/4 sec. 15, T. 3 N., R. 93 W. (near study area)	irrigation	7.56
James Pipeline	SE1/4SE1/4 sec. 15, T. 3 N., R. 93 W. (near study area)	irrigation, domestic, stock	1.00
AQ Ditch	SE1/4SE1/4 sec. 21, T. 3 N., R. 93 W. (near study area)	irrigation	4.17
Durham Spr. No. 2	SE/14NW1/4 sec. 22, T. 3 N., R. 93 W. (near study area)	irrigation, domestic, stock	0.50
Kourlis Spr. #6	NW1/4SW1/4 sec. 23, T. 3 N., R. 93 W. (near study area)	stock	0.033
H Kourlis Ranch #22 Spring	SW1/4NE1/4 sec. 33, T. 3 N., R. 93 W. (near study area)	domestic, stock	0.033
Freund D. #2	SE1/4SW1/4 sec. 33, T. 3 N., R. 93 W. (near study area)	irrigation	0.30
Freund D. #3	NW1/4SE1/4 sec. 33, T. 3 N., R. 93 W. (near study area)	irrigation	0.30
Freund D. #4	NW1/4SE1/4 sec. 33, T. 3 N., R. 93 W. (near study area)	irrigation	0.30

(Colorado Division of Water Resources 1984 and 1985)

* cfs = cubic feet/second

Water quality data is available from USGS Station No. 09304550, about 9 miles downstream from the PRLA. The water appears to be a magnesuim-sulfate type, with total dissolved solid concentrations ranging from 990 mg/l (October 1981) to 9,150 mg/l (December 1978). The total dissolved solid concentrations are abnormally high for this area (USGS 1981, USGS 1979).

Little or no flow occurs in the portions of Curtis Creek within the PRLA. Flows recorded at USGS Station No. 09304550 ranged from 0.02 cfs (July 1978) to 5.8 cfs (May 1980) (USGS 1979, USGS 1981).

The water quality use classifications for Curtis Creek are: Recreation, Class II; Cold Water Aquatic Life, Class II; and Agriculture.

Table 3-5 lists the adjudicated water rights for the Curtis Creek drainage. The locations of the water sources are presented on Map 3-2.

Ninemile Draw

The Ninemile Draw watershed encompasses approximately 5 square miles. Approximately 33 percent of the total watershed lies within the project area. Approximately 1.3 percent of the PRLA is occupied by this watershed (1984a). The Ninemile Draw watershed drains the southeastern portions of the PRLA and Federal lease C-093713. The waters in Ninemile Draw eventually flow into Coal Creek, Beaver Creek, and the White River.

Portions of the headwaters are encompassed by the PRLA and adjacent Federal leases. The majority of these segments are characterized by broad, flat, marshy areas with natural ponds, and relatively gentle channel gradients.

No water quality or measured flow data are available on Ninemile Draw. Field observations indicate marginal flows in the upstream segments (CDM 1984a).

The water quality use classifications for tributaries of Big Beaver Creek are: Recreation, Class II; Cold Water Aquatic Life, Class I; Water Supply; and Agriculture.

Water use in Federal lease C-093713, which is adjacent to the PRLA, is primarily for irrigation, stock, wildlife, and domestic purposes. Adjudicated water rights located within or near the project area are tabulated in Table 3-6. The locations of the water sources are depicted on Map 3-2.

Elkhorn Creek

Approximately 5 percent of the Elkhorn Creek watershed lies in the extreme northeast corner of the PRLA. The watershed occupies 3.2 percent of the PRLA (CDM 1984a). Elkhorn Creek is tributary to Good Spring Creek. Elkhorn Creek is ephemeral within the PRLA, with flows induced only by snowmelt and thunderstorms. Channels are incised in the erosion-resistant bedrock, and the side slopes are steep (CDM 1984a).

Table 3-7 lists the adjudicated water rights within or near the project area (see Map 3-2).

TABLE 3-5
CURTIS CREEK WATERSHED - ADJUDICATED WATER RIGHTS WITHIN AND NEAR PRLA AND FEDERAL LEASE C-093713

Name	Location	Use	Amount (cfs)*
Bradford Spr. W-1	SE1/4NW1/4 sec. 15, T. 2 N., R. 93 W. (in PRLA)	domestic, stock	0.033
Bradford Spr. W-2	NW1/4SW1/4 sec. 15, T. 2 N., R. 93 W. (near study area)	domestic, stock	0.033
Helen Jensen Spr. #3	SE1/4SW1/4 sec. 15, T. 2 N., R. 93 W. (in PRLA)	irrigation, domestic, stock	0.02
Ninemile Ranch Res. #1	SW1/4SE1/4 sec. 16, T. 2 N., R. 93 W. (near study area)	combination	40.71
Ninemile Ranch Res. #1	SW1/4SE1/4 sec. 16, T. 2 N., R. 93 W. (near study area)	combination	26.41
Ninemile Ranch Res. #2	NW1/4NE1/4 sec. 22, T. 2 N., R. 93 W. (near study area)	irrigation, recreation, stock	6.31
Ninemile Ranch Irr. Sys.	NW1/4NE1/4 sec. 22, T. 2 N., R. 93 W. (near study area)	irrigation	6.40
Y-3 Spring	SE1/4SW1/4 sec. 11, T. 2 N., R. 93 W	domestic stock	0.033

(Colorado Division of Water Resources 1984 and 1985)
* cfs = cubic feet/second

TABLE 3-6
NINEMILE DRAW WATERSHED - ADJUDICATED WATER RIGHTS WITHIN OR NEAR PRLA AND FEDERAL LEASE C-093713

Name	Location	Use	Amount (cfs)*
Sheridan Spr. #1	SE1/4SW1/4 sec. 13, T. 2 N., R. 93 W. (in lease C-093713)	stock	0.002
Bradford Spr. W-3	SW1/4NE1/4 sec. 13, T. 2 N., R. 93 W. (in lease C-093713)	stock, domestic	0.033
Bradford Spr. W-4	SE1/4SE1/4 sec. 14, T. 2 N., R. 93 W. (in lease C-093713)	stock, domestic	0.033
Helen A. Jensen Spr. 1	NE1/4NE1/4 sec. 14, T. 2 N., R. 93 W. (near study area)	irrigation, domestic, stock	0.02
Helen A. Jensen Well #7	NE1/4NE1/4 sec. 24, T. 2 N., R. 93 W. (near study area)	irrigation, domestic, stock	0.33

(Colorado Division of Water Resources, 1984 and 1985)

* cfs = cubic feet/second

TABLE 3-7
ELKHORN CREEK WATERSHED - ADJUDICATED WATER RIGHTS WITHIN AND NEAR PRLA AND FEDERAL LEASE C-093713

Name	Location	Use	Amount (cfs)*
H Kourlis Ranch #2 Spring	SE1/4NW1/4 sec. 13, T. 3 N., R. 93 W. (near study area)	irrigation stock, domestic	0.033
H Kourlis Ranch #52 Spring	SE1/4SE1/4 sec. 23, T. 3 N., R. 93 W. (near study area)	stock	0.033
H Kourlis Ranch #5 Spring	NE1/4SE1/4 sec. 23, T. 3 N., R. 93 W. (near study area)	irrigation, stock	0.05
H Kourlis Ranch #8 Spring	SE1/4SW1/4 sec. 24, T. 3 N., R. 93 W. (near study area)	stock	0.033
H Kourlis Ranch #3 Spring	NW1/4NW1/4 sec. 24, T. 3 N., R. 93 W. (near study area)	irrigation, stock, domestic	0.033
H Kourlis Ranch #4 Spring	NW1/4NW1/4 sec. 24, T. 3 N., R. 93 W. (near study area)	irrigation, stock	0.033
H Kourlis Ranch #9 Spring	NW1/4NW1/4 sec. 25, T. 3 N., R. 93 W. (near study area)	stock	0.10
H Kourlis Ranch #50 Spring	SE1/4NE1/4 sec. 26, T. 3 N., R. 93 W. (near study area)	stock	0.033

(Colorado Division of Water Resources 1984 and 1985)

* cfs = cubic feet/second

Little Creek

Approximately 18 percent of the watershed lies within the project area. Approximately 5.6 percent of the PRLA is occupied by this drainage. The Little Creek watershed drains the extreme northeast corner of the PRLA and flows northward into Milk Creek.

The segments of Little Creek encompassed by hte lease boundaries are ephemeral and respond to snowmelt and localized thunderstorms. The channels are steep, vertically incised in erosion-resistant bedrock, and are bordered by steep side slopes.

Table 3-8 (See Errata Sheet) lists the adjudicated water rights within and near the project area (see Map 3-2).

ENVIRONMENTAL CONSEQUENCES

NO DEVELOPMENT ALTERNATIVES

Under the No Development alternatives, the surface water quality and quantity would remain similar to past and present conditions. Portions of the James Creek channel could continue to degrade and be prone to down cutting with high sediment yields until natural controls are established. Continued management practices associated with undeveloped rangeland would have no significant adverse impacts to surface water resources. The area would continue to be used by livestock and wildlife.

DEVELOPMENT ALTERNATIVES

With development, approximately 60 percent of the James Creek watershed would be mined and the current hydrologic regime of the James Creek watershed would be altered. The alteration would result from several factors. First, changes in the premining vegetation of trees and shrubs to the postmining grasses would increase solar radiation and result in earlier snowmelts, earlier peak flows, and decreased evapotranspiration and interception. Second, the peak flows would be less than those during the premining years because water would move more freely into the groundwater system, which would consist of an extensive spoils aquifer. Third, mean annual runoff would increase as a result of the changes in vegetation species composition and soil characteristics. Fourth, the excavation of a part of the current aquifer system would initially decrease baseflows. Shortly after reclamation, however, higher baseflows would occur in the lower half of James Creek where the base of the spoils aquifer is at or above the James Creek valley. BLM estimates between 40 and 400 years would be required before the headwaters of James Creek received baseflows from the spoils aquifer. In the SE1/4 of section 3, and sections 10, 11, and 12 of T. 2 N., R. 93 W., the base of the spoils aquifer would be approximately 50 to 500 feet below the James Creek channel. Assuming that water would percolate vertically to the base of the reclaimed overburden and flow along structurally controlled gradients, and that it would not contact permeable or semi-permeable layers, decades would be required before a zone of saturation in the spoils aquifer would contact the incised valley of upper James Creek. The combined overall effect would significantly alter the present hydrologic characteristics of the James Creek watershed.

Changes in the hydrologic regimes of the Good Spring Creek, Elkhorn Creek, Little Creek, Curtis Creek, and Ninemile Draw watersheds would be negligible.

Mining would remove portions of the natural drainages in the James Creek, Good Spring Creek, Little Creek, and Elkhorn Creek watersheds. Federal and state regulations require that mined lands be returned to their approximate original contour (30 CFR 8125.133 1984, CMLRD Regulations 4.14.2, 1980) and that stream channels be reconstructed to approximately their premined condition (CMLRD Regulations 4.05.4 1980). However, losses to beaver habitats and populations and alteration of the present Williams Fork aquifer system might preclude successful restoration of the present drainage system of James Creek.

Changes in the overall channel characteristics of Good Spring Creek, Little Creek, and Elkhorn Creek would be negligible. No impacts would occur to the Curtis Creek and Ninemile Draw channels.

Changes in the natural sediment aggregation/degradation patterns of portions of the James Creek, Good Spring Creek, Elkhorn Creek, and Little Creek watersheds would occur. The concentration of transportation along the James Creek mainstem could indirectly decrease channel stability and increase streambank erosion of James Creek. Total suspended solid levels (TSS) would increase on-site during the mining and reclamation phases. TSS levels would return to premining levels upon successful establishment of the vegetative and structural reclamation measures. Regulations require that runoff from disturbed surface areas be passed through sedimentation ponds or similar treatment facilities (30 CFR 816.45, 816.46 1984, CMLRD Regulations 4.05.2 1980). Therefore, sediment contributions to areas outside the project area should be negligible during the entire mining operation.

Mining would alter existing water quality both during and after mining. Past studies have indicated increases in surface water total dissolved solid (TDS) concentrations resulting from coal mining (GRHF II DEIS BLM 1983, NW Colorado Coal EIS BLM 1976, GRHF FEIS BLM 1980, NW Supplemental Report BLM 1978, McWhorter and others 1979, and Williams 1985).

The introduction of the spoils aquifer and resultant increases in groundwater residence times and opportunities for ion dissolution would contribute to increases in TDS values in surface water located on the project area and its general periphery. Spoils aquifer water could contain TDS concentrations of approximately 3,000 to 3,900 mg/l, depending on the water's residence time in the reclaimed spoil pile and the properties of the spoil material.

In addition to the TDS contributions from the reclaimed spoil pile, dissolved solids would be directly contributed to the James Creek headwaters from the overburden stockpile during the actual mining phase. Under the current mining proposal, the overburden would be stockpiled in the James Creek headwaters in sections 11 and 12 of T. 2 N., R. 93 W. In section 12, the headwaters are ephemeral and Consol might need to divert water away from the disturbed area, pursuant to CMLRD regulation 4.05.3. The headwaters become perennial in section 11 and any mining disturbance must meet the CMLRD stream buffer zone regulation of 4.05.18.

Elevated levels of TDS would occur in James Creek during the summer and fall months, when the majority of water present in James Creek would come from groundwater sources. Dilution from snowmelt would significantly reduce TDS values in the spring and early summer months. Elevated TDS levels would also occur in Good Spring Creek; however, the increases would not be as dramatic as those occurring in James Creek. Slight increases in TDS values might occur in Elkhorn Creek and Little Creek. No noticable increases would occur in Curtis Creek or Ninemile Draw.

CMLRD regulations require that discharges of water from areas disturbed by surface coal mining must comply with all applicable Federal and state water quality standards (CMLRD Regulations 4.05.2 1980). The Colorado River Basin Salinity Control Forum has adopted a "no salt return where practicable" policy for municipal and industrial dischargers of dissolved solids. If an industrial source emits more than 1 ton per day or

350 tons per year of dissolved solids to the Colorado River mainstem, the operator may be required to perform an analysis to determine whether or not it would be feasible to decrease the effluent load ("Regulations for Implementation of the Colorado River Salinity Standards Through the NPDES Program" 5 CCR 1002-11). With the exception of this regulation, the state of Colorado has not adopted a specific quantitative standard regarding TDS.

A 1979 EPA report indicates that a volume of water equal to about 6.8 times the bulk volume of the spoil material is needed to reduce the electrical conductivity of the spoil leachate to 5 percent of the conductivity of the original material (McWhorter et al. 1979). Based on this study, and assuming that the average depth of the spoil pile is approximately 400 feet, that recharge to the spoil aquifer is approximately 6 inches per year, that conductivity values are linerally correlatable to TDS values, and that natural weathering does not contribute to TDS values, then approximately 5,000 years will be required to reduce TDS values by 95 percent. It is important to note, however, the 1979 EPA study also indicates that a volume of water equal to about one pore volume must be passed through the spoil material before an appreciable reduction in the dissolved solids concentration of the leachate occurs (McWhorter et al: 1979). Therefore, assuming a porosity value of 0.2, significant reductions in TDS values should not occur for hundreds of years after mining.

CMLRD regulations require that compensation be given to the owner of a water right if a water supply is contaminated, diminished, or interrupted from a coal mining operation (CMLRD Regulations 1.12, 4.05.15 1980). The diversions of James Creek water in section 22, T. 3 N., R. 93 W., could be affected by the proposed coal operation, since the natural flow patterns and water quality of James Creek would be altered.

In addition, the diversions removing water from Good Spring Creek in sections 14, 15, 21, and 22 of T. 3 N., R. 93 W., could be impacted by attenuation or contamination of flows. Impacts to other water rights are discussed in the Groundwater section of this document.

The short-term use of the tract for coal extraction would have a long-term impact on the productivity of local and regional surface water sources. Water leaching from the spoils aquifer would increase TDS concentrations in James Creek, Good Spring Creek, Elkhorn Creek, and Little Creek. These increases would contribute to the long-term cumulative effects of additional salt loading in the Colorado River Basin. Increased TDS contributions to the Colorado River Basin would be irretrievable.

No mitigation has been included in this analysis to alleviate post mining impacts to water quality, because no practical measures suitable as lease stipulations exist. Mining of the PRLA would result in some impacts. Potential mitigation would be readdressed during the permitting process.

Conclusion

The hydrologic characteristics of the James Creek watershed would be altered under the proposed mining scenario. Increases in TDS concentrations are anticipated for waters found in the James Creek, Good Spring Creek, Elkhorn Creek, and Little Creek watersheds. Local increases in TDS values might contribute to a cumulative, regional increase in TDS values. Water-rights compensation might be required for owners of local water rights in accordance with applicable law.

GROUNDWATER

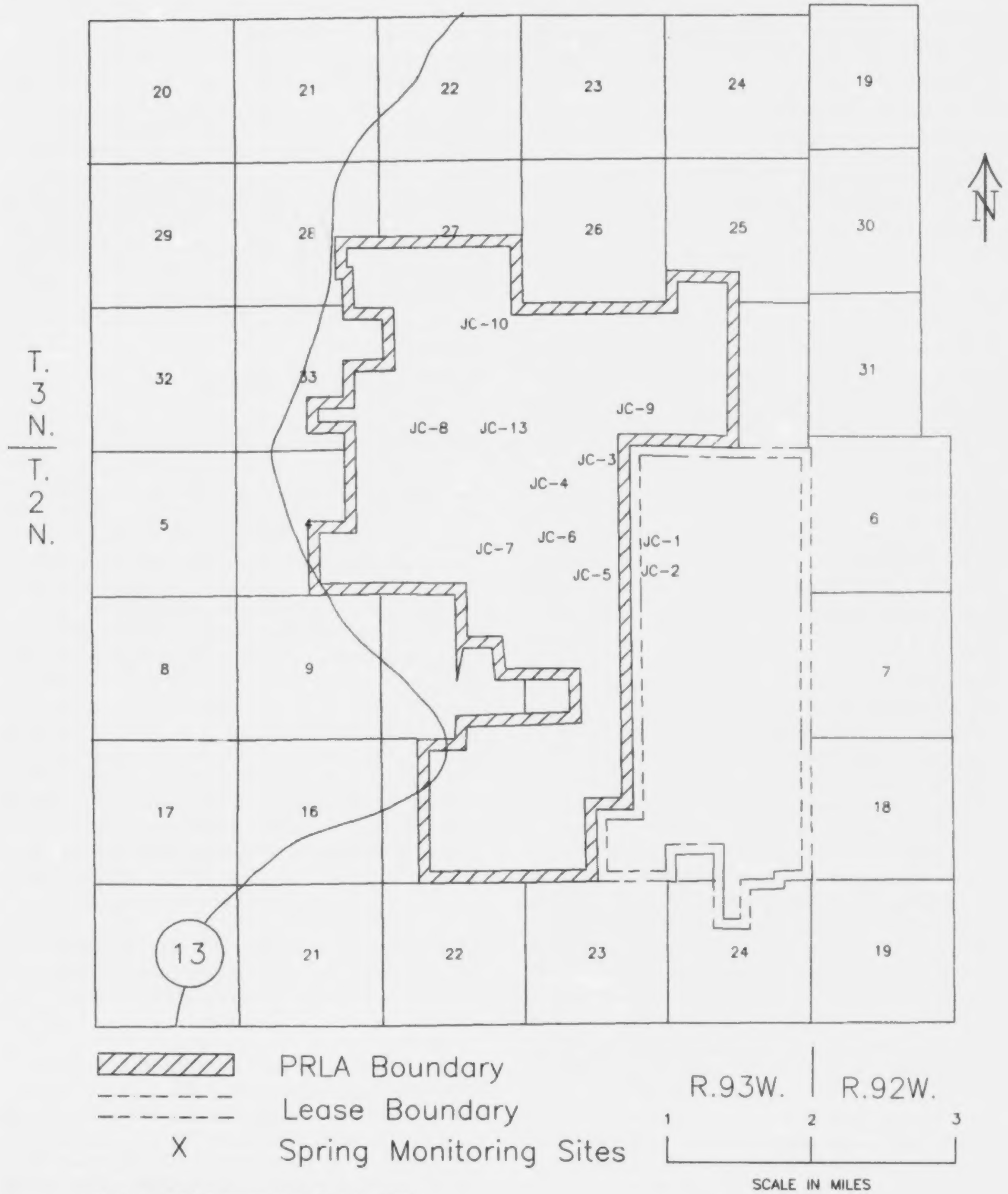
AFFECTED ENVIRONMENT

The PRLA site and adjacent Federal lease C-093713 are located in the southeastern sector of the Danforth Hills area. The Williams Fork and Iles formations of the Cretaceous age Mesaverde Group are the area's geologic units. The axis of the Ninemile (Danforth) Anticline is near the center of the PRLA. The axis of the Sulfur Creek Syncline generally delineates the southern PRLA boundary, and the Elkhorn Syncline is about 1 mile north of the PRLA.

The Williams Fork Formation is characterized by alternating beds of sandstones, shales, siltstones, and coal. The sandstone strata are typically fine to medium grained, calcareous, and lenticular in form. The water bearing sandstone intervals are discontinuous and not extensively laterally correlatable. The regionally important Twenty-Mile Sandstone aquifer of the Williams Fork Formation does not occur within the project area.

Thirteen springs designated JC1 through JC13, which emanate from the perched aquifer system of the Williams Fork Formation, were identified and monitored in 1983 and 1984 (Map 3-3) (CDM 1984a).

Based on the field measurements, the electrical conductivity of the water ranged from 490 to 3,950 umhos/cm. PH values from the springs were relatively uniform, ranging from 7.5 to 8.5 (CDM 1984a). The conductivity values are considered representative of TDS concentrations on the order of 270 to 2,960 mg/l (Hem 1970). The overall bedrock water quality depends on the chemistry of overburden, coal, and interburden strata. The flows of the springs (JC1 to JC13) measured in 1983 and 1984 varied from 0.2 gallons per minute (gpm) to 31.8 gpm (Table 3-9) (CDM 1984a).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JC-4
JC-6
JC-7
JC-5
JC-1
JC-2
T. 3 N.
T. 2 N.
N
PRLA Boundary
Lease Boundary
X
Spring Monitoring Sites
R.93W.
R.92W.
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2
3
SCALE IN MILES

Source: CDM Environmental Report, 1984

Map 3-3 James Creek Spring Monitoring Sites

Spring Name	Discharge (gpm)[c]			Conductivity (μmhos/cm)[a]			pH		
	Aug. 1983	Nov. 1983	July 1984	Aug. 1983	Nov. 1983	July 1984	Aug. 1983	Nov. 1983	July 1984
JC-1	3.2	dry	5.5	580	ND	575	7.7	ND	7.9
JC-2	8.8	5.0	10.3	600	1115	625	7.9	8.0	7.9
JC-3	4.2	dry	6.0	495	ND	490	8.3	ND	8.3
JC-4	4.9	ND[b]	7.8	685	ND	700	8.5	ND	8.3
JC-5	6.3	4.5	6.2	735	720	800	7.9	8.0	7.8
JC-6	6.0	ND	5.2	735	ND	725	7.8	ND	8.1
JC-7	0.5	dry	0.6	1730	ND	1880	8.4	ND	8.2
JC-8	0.5	dry	0.8	3950	ND	3800	7.5	ND	7.9
JC-9	8.6	ND	9.5	1530	ND	1290	8.4	ND	8.5
JC-10	8.5	0.2	10.9	980	1000	980	8.0	8.6	8.1
JC-11	19.9	2.0	24.0	1560	1470	1620	7.7	7.6	7.9
JC-12	22.3	2.6	31.8	2030	1650	2060	8.4	8.5	8.4
JC-13	ND	ND	10.4	ND	ND	1170	ND	ND	8.3

[a] μmhos/cm = conductivity values corrected to 25 degrees C

[b] ND = no data available

[c] gpm = gallons per minute

(CDM 1984a)

Table 3-9 Spring Monitoring Results

Precipitation infiltration is the dominant recharge mechanism on the PRLA and surrounding areas. Discharge occurs via spring flow. Because of the discontinuous nature of the Williams Fork Formation aquifers, both recharge and discharge are likely local phenomena. Infiltrating precipitation percolates downward in recharge areas. Groundwater flow then apparently follows localized fracture or structurally controlled gradients, discharging where down-dip strata intersect valley sides. Flow in the uppermost water bearing intervals is controlled by topographic conditions and the continuity of fractures. Deep zones probably exhibit flow away from the Ninemile Anticline toward both the Elkhorn and Sulfur Creek synclines. The residence time of the water in the Williams Fork aquifers is not very long. Spring discharge locations often occur above areas with significant accumulations of unconsolidated debris. Many of the landforms extend to the valley bottom and serve as important recharge conduits from bedrock springs to the alluvial deposits of the James Creek Valley.

The amount of groundwater contributed to three nearby segments of mountain streams situated in the Williams Fork Formation (Fish Creek near Milner, East Fork of Williams Fork above Willow Creek, and East Fork of Williams Fork near Pagoda) is estimated to range from 25 percent to 31 percent of total stream discharge (USGS 1972). Values similar to these most likely exist for the creeks and Federal lease C-093713.

In addition to the water present in the perched aquifer system of the Williams Fork Formation, groundwater also flows through the alluvial lowland of James Creek. The alluvial area ranges from less than 50 to as much as 250 feet in width. The alluvial thickness may exceed 30 to 40 feet in some areas. Most likely, all but the upper 10 to 15 feet of the alluvial deposits are saturated. Seeps are common in the lower sections of the streambanks, and the valley meadow and wetland vegetation indicates a shallow water table.

Water table levels fluctuate seasonally. Because the flooding in 1984 scoured portions of the alluvium and breached some beaver dams, the amount of water flowing through the alluvial aquifer is less than the amounts of previous years.

Additional information about the James Creek alluvial valley can be found in the Alluvial Valley Floor section of this document.

The Iles Formation lies below the Williams Fork Formation. The uppermost sandstone of the Iles Formation is the Trout Creek Sandstone Member, an important regional aquifer. Although the Trout Creek Sandstone Member underlies the entire project area, at depths ranging from 80 to 1,000 feet, no outcrops occur.

Adjudicated water rights on groundwater sources located within or near the PRLA and Federal lease C-093713 are listed in tables 3-3 and 3-8, located in the Surface Water section of this document.

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives.

The quality and quantity of the project area's groundwater resources would remain similar to past and present conditions. Management practices associated with undeveloped rangeland would continue, with no significant adverse impacts to groundwater resources.

Development Alternatives.

The alteration of the project area's Williams Fork Formation aquifers and/or their recharge areas would displace, reduce, or eliminate the flows of the springs and seeps present within the mined area and in the general periphery (see Map 3-4).

Under the current mining proposal, the following springs would be removed.

H. Kourlis Ranch #11 Spring NE1/4SE1/4 sec. 34, T. 4 N., R. 93 W.

H. Kourlis Ranch #16 Spring SW1/4SE1/4 sec. 35, T. 3 N., R. 93 W.

H. Kourlis Ranch #15 Spring NE1/4SE1/4 sec. 35, T. 3 N., R. 93 W.

JC-10 Spring SE1/4NE1/4 sec. 34, T. 3 N., R. 93 W.

JC-13 Spring SE1/4SE1/4 sec. 34, T. 3 N., R. 93 W.
JC-9 Spring SE1/4SE1/4 sec. 35, T. 3 N., R. 93 W.

JC-3 Spring NW1/4NE1/4 sec. 2, T. 2 N., R. 93 W.

JC-4 Spring SW1/4NW1/4 sec. 2, T. 2 N., R. 93 W.

JC-6 Spring NE1/4SE1/4 sec. 2, T. 2 N., R. 93 W.

JC-5 Spring SW1/4SE1/4 sec. 2, T. 2 N., R. 93 W.

JC-1 Spring NE1/4SE1/4 sec. 2, T. 2 N., R. 93 W.

JC-2 Spring SE1/4SE1/4 sec. 2, T. 2 N., R. 93 W.

H. Kourlis Ranch #13 Spring NE1/4SW1/4 sec. 36, T. 3 N., R. 93 W.

In addition, because of the removal of portions of their recharge areas, the following springs could have their flows reduced, as a result of the mining operation.

H. Kourlis Ranch #14 Spring SE1/4SW1/4 sec. 26, T. 3 N., R. 93 W.

H. Kourlis Ranch #50 Spring SE1/4NE1/4 sec. 26, T. 3 N., R. 93 W.

H. Kourlis Ranch #7 Spring (JC-11) NW1/4SW1/4 sec. 26, T. 3 N, R. 93 W.

H. Kourlis Ranch #22 Spring SW1/4NE1/4 sec. 33, T. 3 N., R. 93 W.

JC-7 Spring SE1/4SE1/4 sec. 3, T. 3 N., R. 93 W.

JC-8 Spring SW1/4SE1/4 sec. 34, T. 3 N., R. 93 W.

H. Kourlis Ranch #10 Spring NW1/4NE1/4 sec. 34, T. 3 N., R. 93 W.

H. Kourlis RAnch #12 Spring NE1/4SW1/4 sec. 36, T. 3 N., R. 93 W.

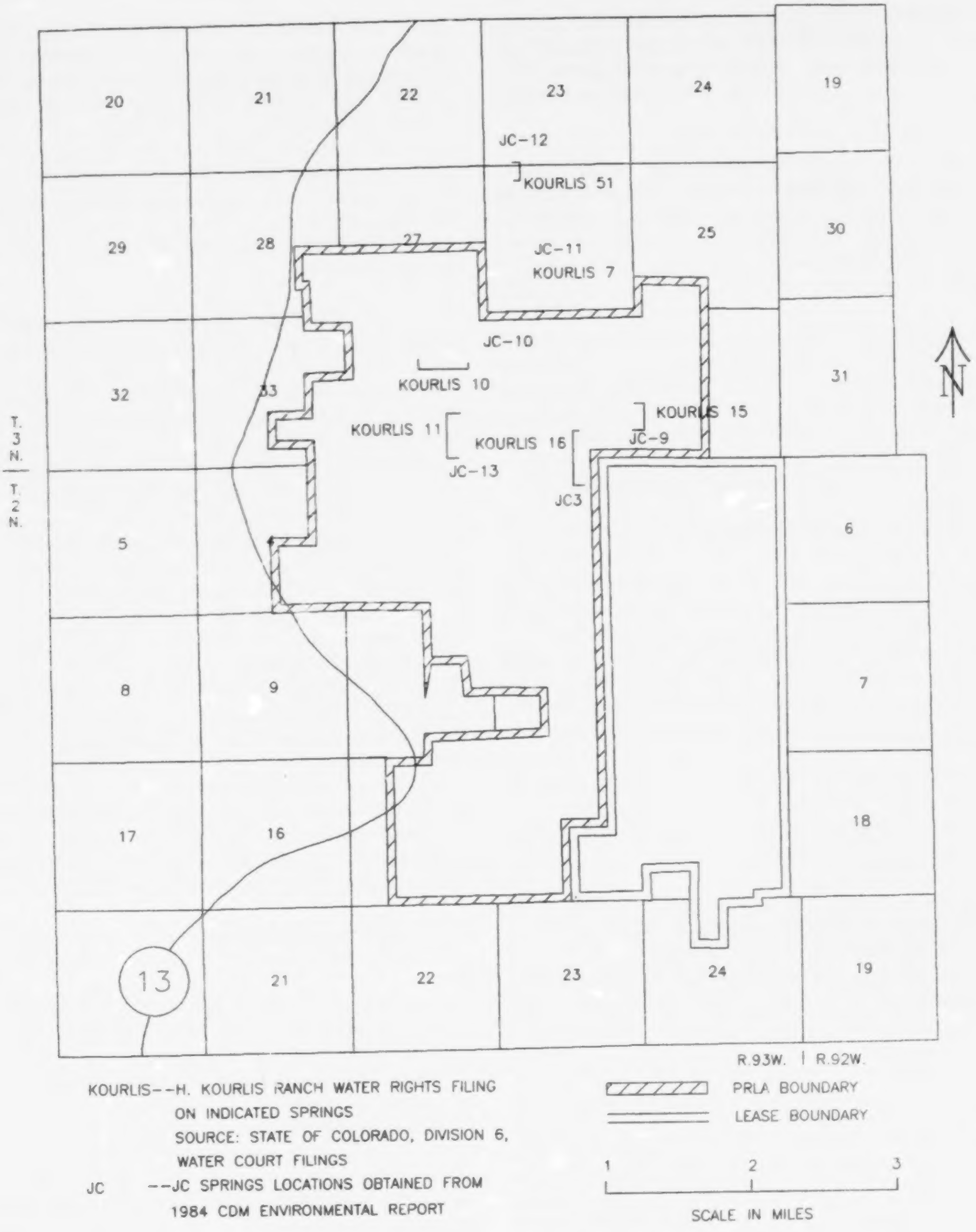
H.A. Bradford Spring 1 SW1/4SW1/4 sec. 31, T. 3 N., R. 92 W.

H.A. Bradford Spring 2 NW1/4SW1/4 sec 31, T. 3 N., R. 92 W.

Changes in aquifer properties and groundwater flow patterns would result from disturbing the overburden during mining and subsequent reclamation efforts. The spoil materials would have a much higher vertical permeability, and groundwater would be recharged to the depth of the spoil materials instead of moving laterally along the highest impermeable shale layers (McWhorter 1979). New springs might emanate from contact surfaces between the reclaimed overburden and less permeable unmined areas, or from a point where a valley intersects one of the spoils aquifer's zones of saturation. New springs might also appear where the spoil aquifer hydraulically communicated with an aquifer of similar properties and water traveled laterally in a structurally controlled direction (down-dip) and discharged off-site. The appearance of new springs depends on numerous variables, including the depth of spoil materials, heights of the spoil aquifers zones of saturation, the properties of the spoil material and adjacent geology, and the time necessary for spoil aquifer resaturation.

Changes would occur in the current groundwater flow contributions to James Creek. In the southeastern portion of the mined area, the bottom of the mine pit would be approximately 50 to 500 feet below the James Creek channel. Although groundwater movement is anticipated to be in a down-dip direction toward the channel, decades might be required to resaturate the spoils aquifer before the water level is at the same elevation as that of upper James Creek. BLM estimates that resaturation of the spoils aquifer in the upper portions of the James Creek Watershed would take between 40 and 400 years, assuming the spoils aquifer is isotropic, homogeneous, unconfined, and possesses an impermeable boundary (McWhorter, EPA 1982).

The northern section of the mined area would have pit depths above or equal the James Creek valley.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JC-11
KOURLIS 7
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SCALE IN MILES

KOURLIS--H. KOURLIS RANCH WATER RIGHTS FILING ON INDICATED SPRINGS
SOURCE: STATE OF COLORADO, DIVISION 6, WATER COURT FILINGS
JC --JC SPRINGS LOCATIONS OBTAINED FROM 1984 CDM ENVIRONMENTAL REPORT

Map 3-4 Spring Location Sites

Groundwater discharges into the northern end of James Creek would occur shortly after reclamation. Groundwater contributions from the spoils aquifer would appear in section 3, T. 2 N., R. 93 W., and sections 34 and 27, T. 3 N., R. 93 W.

A situation related to this scenario occurred at the Energy Mine No. 1, located near the town of Oak Creek. The spoil pile was located above the elevation of the Foidel Creek channel. Approximately 7 years after mining was completed, groundwater began discharging from the spoil pile into Foidel Creek.

Changes in the existing groundwater quality of the project area and its periphery would also occur under the development alternatives. Currently, groundwater has minimal contact with the natural stratigraphic sequences of sandstones, shales, and coal seams. After reclamation, however, the water would percolate deep through the unconfined spoils aquifer and would have greater opportunities for dissolving soluble minerals. This leaching would increase groundwater concentrations of TDS.

Studies of existing and simulated mining situations that are similiar to the proposed Consol operation report that postmining spoils aquifer groundwater TDS concentrations can range from approximately 2,000 mg/l to 3,900 mg/l (Parker and Norris 1983, Williams 1985, McWhorter 1979, Peabody Coal Company 1985, Pittsburg and Midway Coal Mining Company 1985, Getty Oil Company 1985, and Williams 1985). Therefore, the TDS concentration of the mined area's groundwater might range from 2,000 to 3,900 mg/l, the variability is dependent on the water's residence times and the chemical and physical properties of the spoil.

The ions primarily responsible for contributing to the TDS content would be calcium, sodium, magnesium, bicarbonate, and sulfate. The increased TDS values of the groundwater and receiving surface waters could adversely impact water users. The Colorado West Area's 208

Plan recommended a maximum of 3,000 mg/l TDS for livestock use (CWACOG 208 Plan, 1979), and the high TDS groundwater values might affect the local area's livestock and wildlife use. In addition, the effects of leachate movement into nearby perennial and ephemeral stream channels may be detrimental to nearby irrigated crops. The EPA and Colorado West Area Council of Governments state that water with TDS values ranging between 1,000 and 2,000 mg/l may have adverse effects on many crops and therefore, requires careful management practices. Water with TDS concentrations of 2,000 to 5,000 mg/l can only be used for tolerant plants on permeable soils (EPA 1976, CWACOG 208 Plan 1979). Of particular concern would be the water flowing in James Creek and immediately downstream in Good Spring Creek. During the spring and early summer when James Creek would be supplied with water primarily from snowmelt (through overland flow and interflow processes), groundwater discharge should be significantly diluted. However, during the summer and early fall months, groundwater contained in the spoils aquifer and James Creek alluvium would supply a significant percentage of the James Creek flow. Elevated TDS concentrations could be limiting to users of James Creek and Good Spring Creek water.

In addition, the higher TDS concentrations might contribute to cumulative, regional increases in TDS values of the Colorado River Basin. The Colorado River Basin Salinity Control Forum has adopted a "no salt return where practicable" policy for municipal and industrial dischargers of dissolved solids. If an industrial source emits more than 1 ton per day, or 350 tons per year, of dissolved solids to the Colorado River mainstem, the operator might be required to perform an analysis to determine whether or not it would be feasible to decrease the effluent load ("Regulations for Implementation of the Colorado River Salinity Standard Through the NPDES Program" 5 CCR 1002-11). With the exception of this regulation, the state of Colorado has not adopted a specific quantitative standard regarding TDS.

CMLRD regulations require that compensation be given to the owner of a water right if a water supply has been contaminated, diminished, or interrupted from a coal surface mine operation (CMLRD Regulations 1.12, 4.05.15 1980). Under the current mining proposal, the following adjudicated water sources would be removed and the holders of the adjudicated water rights would require compensation.

H Kourlis Ranch #11 Spring NE1/4SE1/4 sec. 34, T. 3 N., R. 93 W., 0.04 cfs

H Kourlis Ranch #16 Spring SW1/4SE1/4 sec. 35, T. 3 N., R. 93 W., 0.03 cfs

H Kourlis Ranch #15 Spring NE1/4SE1/4 sec. 35, T. 3 N., R. 93 W., 0.03 cfs
H Kourlis Ranch #13 Spring NE1/4SW1/4 sec. 36, T. 3 N., R. 93 W., 0.10 cfs

Jensen No. 4 Well SW1/4SE1/4 sec. 1, T. 2 N., R. 93 W., 0.013 cfs

Jensen No. 1 Well NW1/4NW1/4 sec. 1, T. 2 N., R. 93 W., 0.013 cfs

In addition, flows might be attenuated during dry months in the following adjudicated water sources, and the holders of the adjudicated water rights would require compensation.

H Kourlis Ranch #14 Spring SE1/4SW1/4 sec. 26, T. 3 N., R. 93 W., 0.03 cfs

H Kourlis Ranch #50 Spring SE1/4SW1/4 sec. 26, T. 3 N., R. 93 W., 0.033 cfs

H Kourlis Ranch #7 Spring NW1/4SW1/4 sec. 26, T. 3 N., R. 93 W.,

H Kourlis Ranch #22 Spring SW1/4NE1/4 sec. 33, T. 3 N., R. 93 W., 0.033 cfs

H Kourlis Ranch #10 Spring NW1/4NE1/4 sec. 34, T. 3 N., R. 93 W., 0.70 cfs

H Kourlis Ranch #12 Spring NE1/4SW1/4 sec. 36, T. 3 N., R. 93 W., 0.10 cfs

H.A. Bradford Spring 1 SW1/4SW1/4 sec. 31, T. 3 N., R. 92 W., 0.08 cfs

H.A. Bradford Spring 2 NW1/4SW1/4 sec. 31, T. 3 N, R. 92 W., 0.02 cfs

AQ No. 1 Ditch SE1/4NW1/4 sec. 22, T. 3 N., R. 93 W., 5.30 cfs
AQ No. 1 Ditch HGT No. 1 SE1/4NW1/4 sec. 22, T. 3 N., R. 93 W., 1.80 cfs

Also, if sources (ditches, springs, reservoirs, and wells) within the general periphery of the mined area experience elevated TDS or other contaminent levels, compensation to the water right holder would also be required.

Compensation would not be required if Consol purchased water rights from the current holders.

Preliminary findings indicate that the Trout Creek Sandstone Member would not be impacted, as it lies 118 to 215 feet below the last minable seam and is separated from the coal by interbedded sandstones and shales, and because no Trout Creek Sandstone outcrops are present in the project area. However, due to the structural contortions of the area, fracture systems could exist between the Trout Creek Member and the overlying Williams Fork Formation. Additional data would be required to determine the extent of fracturing. If fracturing were extensive, the Trout Creek Sandstone Member would be adversely affected by the mining operations.

The short-term use of the area for coal extraction would have a long-term impact on groundwater productivity. Groundwater in and near the mine area would be significantly degraded by the increase in TDS concentrations. Availability of groundwater in the southeastern portion of the mined area might be limited for 40 to 400 years, until the spoils aquifer became resaturated and water could be readily extracted.

Alteration of the project area's Williams Fork aquifer system would be an irretrievable impact. The increased salt load from leaching of the spoil aquifer would irretrievably increase salt loads in the project area and its general periphery. The increased TDS concentrations would contribute to regional increases in the Colorado River Basin.

To more clearly define groundwater-surface water relationships within coal spoil piles, BLM has initiated a hydrologic study at Seneca Mine in the Twentymile Park area. The objectives of the project are to study and determine spoil pile recharge and discharge characteristics, determine rates of water movement through spoils, and study changes in groundwater quality within spoil water. From this work, BLM soon may be able to more specifically quantify changes in the hydrologic system due to coal mining impacts.

No mitigation has been included in this analysis to alleviate post mining impacts to water quality, because no practical measures suitable as lease stipulations exist.

The PRLA will result in some impacts. Potential mitigation will be readdressed during the permitting process.

Conclusion

Development would displace, reduce, or possibly eliminate the flows of existing springs in or near the proposed mined area. The replaced spoils aquifer would have different properties and water would be recharged to depth instead of moving laterally along the impermeable perched strata. Groundwater quality would be degraded from the increases in TDS concentrations. Impacts to water rights in the project area and its general periphery could require compensation to the owners. BLM's Preferred Alternative could partially replace the present aquifer conditions, but the amount of flow from any artificially created seep areas and the life-spans of the structures cannot be quantified at this time.

FLOODPLAINS

AFFECTED ENVIRONMENT

BLM regulations require identification of floodplains (based on a 24-hour precipitation event with a 100 year recurrence interval) on which mining could not be undertaken without substantial threat of loss of life or property (43 CFR 3461.1, 1984).

Using computed peak flows and channel cross section measurements, estimates of floodplain widths were derived for James Creek and Good Spring Creek. The floodplain boundaries are approximately the same as the boundaries of the unconsolidated stream-laid deposits shown in Figure 3-1 in the Alluvial Valley Floors section (CDM 1984a).

The estimated discharge associated with a 100-year event for the James Creek watershed ranges between approximately 558 and 731 cfs (CDM 1984a). The volume of water estimated to flow during the storm is about 290 acre-feet (CDM 1984a).

The estimated discharge associated with a 100-year event for the Good Spring Creek watershed ranges between approximately 1,224 and 1,730 cfs (CDM 1984a). The volume of water estimated to flow during the storm is about 1,367 acre-feet (CDM 1984a).

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

The James Creek and Good Spring Creek floodplains would be generally unaffected by the current practices associated with undeveloped rangeland management.

Development Alternatives

Without the required proper flood control measures (prudent planning of loadout facilities and the transportation corridor), a substantial threat to Highway 13/789 and a ranch property located about 3/4 mile downstream from the James Creek and Good Spring Creek confluence could occur.

GEOLOGY AND MINERALS

PHYSIOGRAPHY

Consol's project area lies on the western edge of the Southern Rocky Mountain physiographic province. The White River Plateau is to the southwest and the eastern Uinta Mountains are west of the project area (Brownfield and Johnson 1980). Locally, the Danforth Hills occupy the northeast rim of the Piceance Basin (Haines 1975).

Altitudes in the project area range from 8,673 feet to less than 6,640 feet (USGS 1966). The area is characterized by hills with steep, brushy slopes ranging from 15 to 28 degrees and narrow valleys (Haines 1975). Good Spring Creek and its tributary, James Creek, flow northward into Milk Creek and on into the Yampa River, approximately 13 miles north of the Ninemile Gap topographic quadrangle. Drainage in the area appears to have a trellis pattern that would indicate fracture zones or underlying rocks of differing resistance to erosion such as would occur in folded strata.

COAL

Affected Environment

Coal mining in Rio Blanco County has been operating on a small scale since the 1880s, with production geared primarily to supply coal for local needs. Forty-seven mines have been recorded, but this number may not be accurate because of sales and eventual renaming of mines and thus duplicate records. Recently, near Meeker, the Reinau No. 2 was shut in and reclaimed. The Colowyo mine, about 5 miles north of the PRLA in Moffat County, is operating.

See the Economics section of this document and the Federal Coal Program Draft Environmental Impact Statement supplement, February 1985, for details on regional mining and trends.

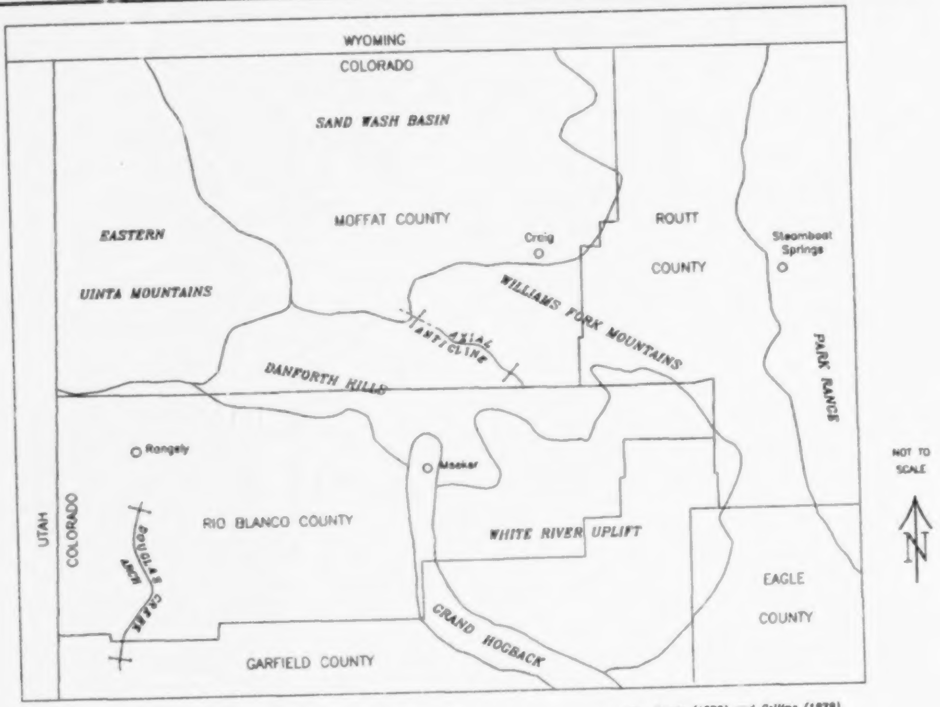
Several federal leases and PRLAs occur in the general vicinity of the James Creek PRLA, as shown on Map 1-2. (The Jensen Miller PRLA, which is analyzed in the Northwest Colorado Coal Preference Right Lease Application's Environmental Impact Statement, lies approximately 2 miles southwest of the James Creek PRLA, while the Chapman-Riebold PRLA lies approximately 55 miles to the west.)

Structure

Regionally, Sand Wash Basin, extending from southern Wyoming into northwestern Colorado, and Piceance Basin to the south, are separated by the Axial Basin uplift (Brown 1983). The White River Uplift rises out of the Piceance Basin via the Grand Hogback monocline southwest of Meeker (Tweto 1979). Map 3-5 shows regional structural features.

Major structural features in the project area are the Sulphur Creek Syncline, Danforth Hills Anticline, and the Elkhorn Syncline (Haines 1975). Map 3-6 shows these features as demonstrated by structural contours drawn on top of the Trout Creek Sandstone.

Beds dip from 3 1/2 to 20 degrees, averaging 11 1/2 degrees, in a direction ranging from northeast to


WYOMING
COLORADO
SAND WASH BASIN
MOFFAT COUNTY
EASTERN
UINTA MOUNTAINS
Craig
ROUTT
COUNTY
Steamboat Springs
WILLIAMS FORK MOUNTAINS
AXIAL ANTICLINE
DANFORTH HILLS
PARK RANGE
Rangely
Meeker
UTAH
COLORADO
DOUGLAS CREEK ARCH
RIO BLANCO COUNTY
WHITE RIVER UPLIFT
EAGLE
COUNTY
GRAND HOGBACK
GARFIELD COUNTY
NOT TO SCALE
N

after Tweto (1979) and Collins (1979)

Map 3-5 General Regional Structure of Northwest Colorado

northwest (Haines 1975); forming the northern limb of the Danforth Hills Anticline. The southern limb dips in a south-southwestern direction in the PRLA and adjacent lease area, with the dip becoming steeper toward the Sulfur Creek Syncline. See Map 3-6.

No significant faulting is known in the immediate project area.

Stratigraphy

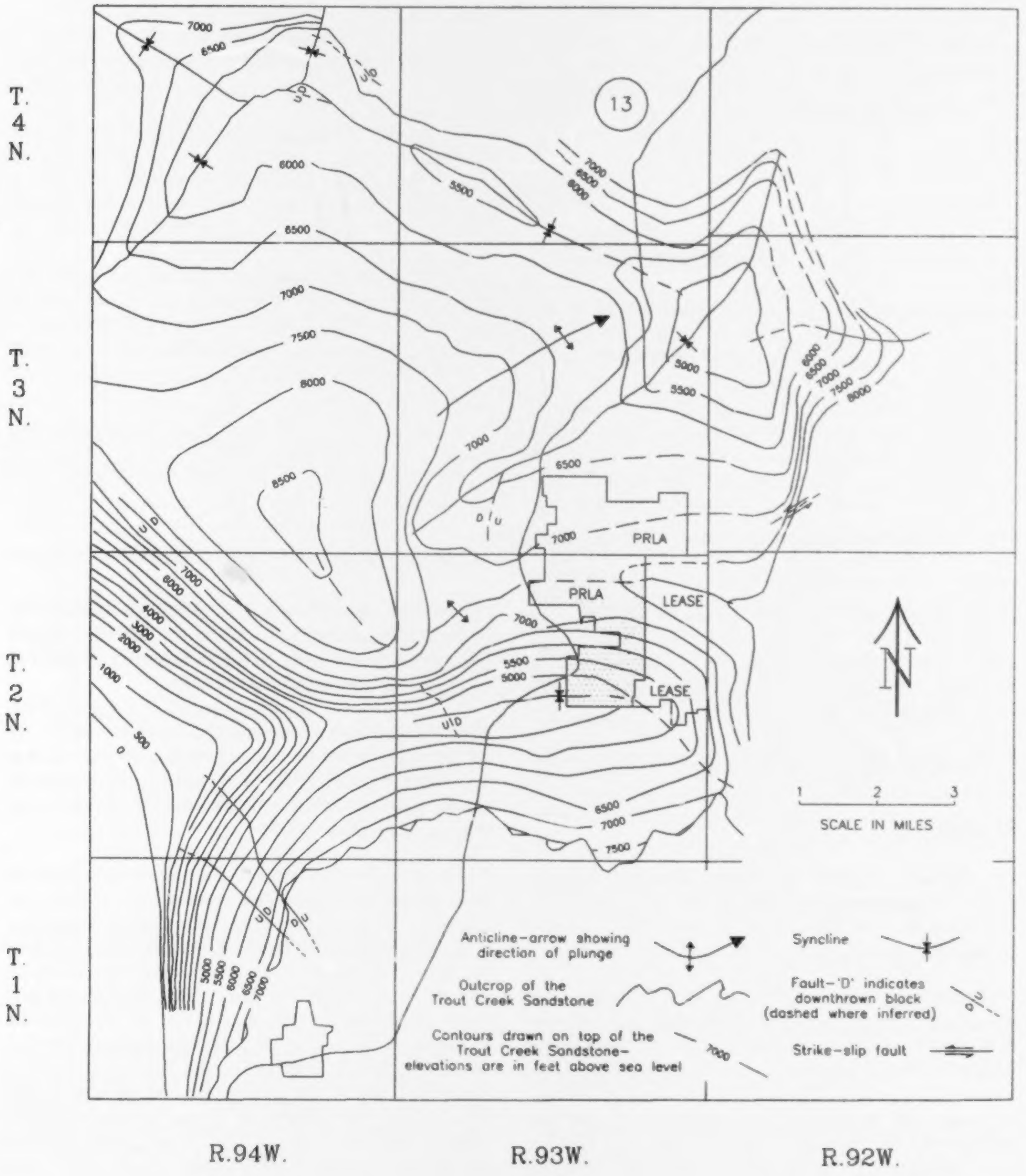
The Upper Cretaceous Mesaverde Group is the only major stratigraphic unit to crop out in the project area and to contain the coal deposits of interest. Thus, only the stratigraphy of the Mesaverde Group will be discussed.

The Mesaverde Group is divided into two units: the upper unit is the Williams Fork Formation, and the lower is the Iles Formation. The top of the Iles Formation is considered to be the Trout Creek Sandstone Member. The Trout Creek Sandstone, a clean white sandstone, averages 180 feet thick and provides a prominent stratigraphic marker and a regionally important aquifer. The coals of interest lie above the Trout Creek. The Iles Formation overlies the Cretaceous Mancos Shale (an oil and gas producing formation in the region) and consists of sandstone, shale, and coal. The coals within the Iles occur in two groups, the Black Diamond coal group and the Lower coal group, and have been mined south of the project area. According to Haines (1975), "It is difficult to project these beds, however, into the lands included in these applications owing to the lenticularity of the beds and frequent poor quality of the coals."

The Williams Fork Formation of the Mesaverde Group occurs at the surface throughout much of the project area and has been eroded away in places. It consists of sandstone, shale, and the coal beds of interest within the project area (Haines 1975).

The coals within the Williams Fork Formation occur in three groups separated by intervals of "barren" shale and sandstone. The uppermost, the Lion Canyon coal group, is "considered to be eroded from the area of the application land" (Haines 1975). The Goff coal group, about 700 feet thick, lies under the Lion Canyon Sandstone and about 2,300 feet to 3,000 feet above the Trout Creek Sandstone. There is about 1,000 feet between the Goff coal group and Fairfield coal group. The top of the Fairfield coal group, which contains the beds of interest, lies about 1,300 feet above the Trout Creek Sandstone (Haines 1975). Figure 3-1 shows a generalized stratigraphic column of the groups.

Correlation of specific coal beds is very difficult in this region due to the lenticularity of the beds. Some seams have been named for the mines they have supported;


T. 4 N.
T. 3 N.
T. 2 N.
T. 1 N.
R.94W.
R.93W.
R.92W.
13
PRLA
PRLA
LEASE
LEASE
N
1 2 3
SCALE IN MILES
7000
6500
6000
5500
8000
7500
8500
5000
4000
3000
2000
1000
500
0
U/D
D/U
Anticline—arrow showing direction of plunge
Syncline
Outcrop of the Trout Creek Sandstone
Fault—'D' indicates downthrown block (dashed where inferred)
Contours drawn on top of the Trout Creek Sandstone—elevations are in feet above sea level
Strike-slip fault

Map 3-6 Structure Contours on Top of the Trout Creek Sandstone

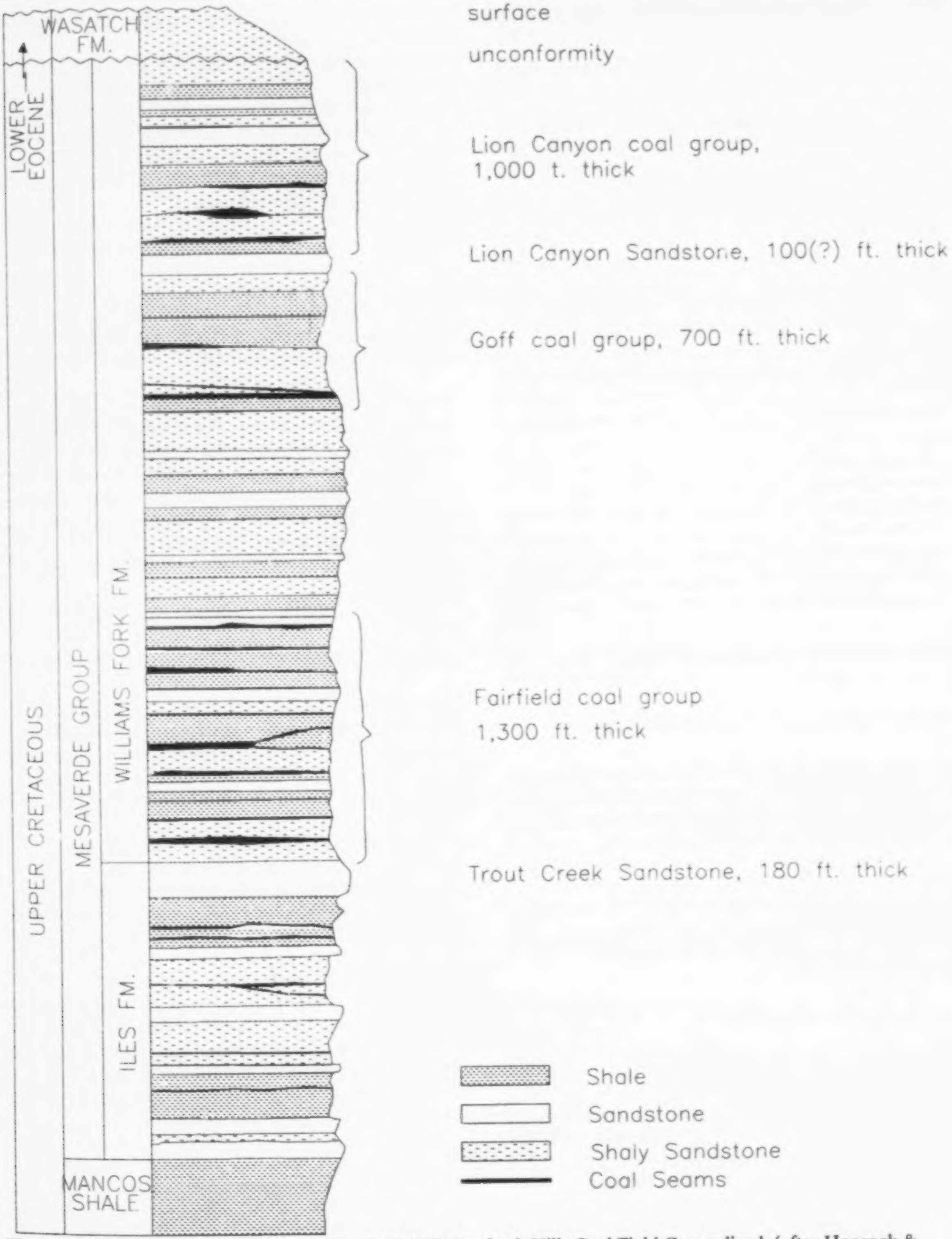

WASATCH FM.
LOWER EOCENE
UPPER CRETACEOUS
MESAVERDE GROUP
WILLIAMS FORK FM.
ILES FM.
MANCOS SHALE
surface
unconformity
Lion Canyon coal group, 1,000 t. thick
Lion Canyon Sandstone, 100(?) ft. thick
Goff coal group, 700 ft. thick
Fairfield coal group 1,300 ft. thick
Trout Creek Sandstone, 180 ft. thick
Shale
Sandstone
Shaly Sandstone
Coal Seams

Figure 3-1 Partial Stratigraphic Section Danforth HillsDanforth Hills Coal Field Generalized (after Hancock & Eby, 1930)

however, seams cannot be accurately traced very far from that mine.

Coal Reserves.

Consol estimates coal reserves within the PRLA and adjacent leases at 1 billion tons. Estimated in-place reserves for the lease application alone are 610 million tons (Haines 1975). However, data is inconclusive; Consol reports that 250 million tons of coal can be recovered from the proposed mine area. Coal quality in this region is reported to be high volatile C bituminous (Dames and Moore 1979).

Regulatory requirements concerning diligent development and continued operations would have to be met. 43 CFR 3483 regulations can be summarized as requiring that 1 percent of the recoverable reserves be developed within 10 years of the lease issuance or lease readjustment date and each year thereafter. According to the proposed mine plan, 280 million tons of coal are assumed recoverable within the project area. To comply with the continued operations regulations, approximately 2.8 million tons must be produced each year. Advance royalty may be paid in lieu of continued operations, if production requirements are not met during the year. However, advance royalty may be accepted for no more than 10 years.

Environmental Consequences

No Action/No Development Alternatives

No other development or leasing is being considered at this time. If and when any other leasing or development is proposed, additional environmental documentation would be prepared, as required.

The lands currently within the application for a preference right lease could be offered for competitive leasing in a future coal lease sale, and development could occur at that time. Consol could develop lease C-093713 if the PRLA is not leased.

Development Alternatives

Consol has changed its mining proposal in the amended initial showing to avoid surface disturbance of the elk calving areas, potential elk winter concentrations areas and elk migration routes. These proposed avoidance areas would preclude development of approximately 100 million tons of coal resources. Inclusion of these lands in the mine plan would increase the recoverable reserve base to approximately 380 million tons, thus increasing the mine life by ten years. The 100 million tons precluded in elk avoidance areas could conceivably be mined if, after reclamation of the proposed mine area, the elk shifted to those lands rendering the proposed avoidance areas suitable for surface mining.
The economic feasibility of recovery of this coal at a later date is doubtful. It would essentially require opening a new, separate pit. Given the number of seams containing the 100 million tons and the associated interburden and overburden, the stripping ratio could be too high to warrent opening a separate, smaller pit economically. In effect, this coal could be bypassed.

Avoidance of the 100 million tons would preclude payment of 12.5 percent of the selling price of the coal as royalties to the federal government and the shared percentages to the state and local governments. (See the Economics, Environmental Consequences section for a discussion on potential revenues.)

The avoidance of elk use areas would preclude 10 years of mining or approximately 100 million tons of coal from development. It would also force relocation of surface facilities and the overburden stockpile from the ridge tops near Ninemile Gap as outlined in the amended initial showing, into the James Creek drainage as is described in Consol's current proposal (Chapter 2).

OIL AND GAS

Affected Environment

Oil and gas have been produced near Consol's lease area since 1938, from Cretaceous and Jurassic Age formations. These formations are stratigraphically several thousand feet below the Upper Cretaceous beds proposed for coal mining.

Known Geologic Structures

There are two known geologic structures (KGSs) near the project area from which oil and gas are currently being produced.

The Ninemile KGS partially overlaps Consol's coal lease C-093713 that is adjacent to the subject preference right lease application. The KGS was established August 22, 1966 (Witherbee, oral commun. 1985). As of January 1, 1983, the Ninemile field has produced approximately 988,440 barrels of oil from the Lower Cretaceous Dakota Sandstone (State of Colorado 1983).

The Wilson Creek KGS was established December 9, 1938 (Witherbee, oral commun. 1985), about 2 miles west of Consol's project area. The field has produced 57,021,598 barrels of oil and 55,232,857,000 cubic feet of gas from the Jurassic Morrison Formation as of January 1, 1983 (State of Colorado 1983).

Unit Agreements

Two unit agreements exist near Consol's project area. A unit agreement is an agreement between leaseholders concerning the methods by which the oil and gas field will be explored and developed. A unit agreement does not necessarily coincide with a KGS but indicates production or a potential for production.

The Wilson Creek Unit is located approximately 1/2 mile from Consol's western boundaries.

The McHatton Reservoir Unit partially overlaps Consol's coal lease C-093713. Cumulative production is 2,900 barrels of oil from the Niobrara equivalent interval of the Upper Cretaceous Mancos Shale (State of Colorado 1983).

Existing Leases and Wells. Of the 32 oil and gas leases within Consol's project area, 21 are on the preference right lease application.

Petroleum Information Corporation reports two dry and abandoned wells within the boundaries of preference right lease application C-0126998.

Environmental Consequenes

No Action/No Development Alternatives

If Consol's project area were not developed for coal, the oil and gas leases could be developed without constraints from coal development.

Development Alternatives

The potential exists for conflicts between simultaneous coal and oil and gas development regarding surface occupation. There would be no impact to the oil and gas reservoirs from mining because the oil and gas horizons are considerably below the 800 feet maximum pit depth Consol proposed.

Conclusion

Oil and gas leases should not significantly conflict with coal development, as long as coal and oil and gas lessees can come to an agreement concerning development prior to mining.

OTHER MINERALS

Affected Environment

No leaseable minerals other than oil, gas, and coal are known to exist in significant quantities within the project area (BLM 1982). A record search revealed no mining claims on lands included in the PRLA C-0126998.

No salable materials, such as sand and gravel or scoria, have been sold or permitted for use by BLM (Beckett, oral commun. 1985). Scoria is known to exist in the area; however, the amount and development potential is unknown.

Environmental Consequences

No Action/No Development Alternatives

No impacts are anticipated.

Development Alternatives

Since no significant quantities of locatable or leaseable minerals are known other than coal, oil, and gas, coal mining would have an insignificant impact on these minerals. Development of salable materials could be precluded by coal mining. Salable materials could be developed within the project area prior to and during mining.

Conclusion

No significant impacts are anticipated on locatable or other leaseable minerals under any alternative. If salable materials were developed prior to and during mining, only that material intermixed with the overburden would be irretrievably lost.

GEOLOGIC HAZARDS

Affected Environment

Landslides of various types are common in the Danforth Hills. Colton, et al. (1975), show landslide deposits in all of the major stream valleys within Consol's project area as of 1975. Heavy snowmelt in the spring of 1984 caused extensive landsliding in the Danforth Hills and recent landslides have been sighted within the project area (Beckett, oral commun. 1985).

Rapid earthflow-type landslides frequently occur on north-facing slopes throughout the project area. The debris consists of partially decomposed shale, siltstone, coal, and sandstone that occurs as a mantle over the slope.

Piping, a form of underground erosion, has been observed in the alluvium of James Creek's upper reaches. The alluvium consists of unconsolidated silt, shale, and clay. The piping occurs along the portions of the channel that have been influenced by beaver dams. The piping is probably initiated when the dams are breached and the alluvium is dewatered as the ponds drain. Several sinkholes have been observed as a result of piping, with dimensions ranging from approximately 10 inches to 4 feet in diameter and 1 to 3 feet in depth.

The narrow stream valleys in the area present the potential danger of flash floods (Haines 1975).

Spring snowmelt provides the lubricant for unconsolidated sediments to become unstable. The unconsolidated sediments are generally stable in a dry state.

Environmental Consequences

No Action/No Development Alternatives

No impacts would occur.

Development Alternative

During initial development and reclamation, landslides could endanger the mine operation. With proper design of mining and reclamation techniques, long-term soil stability would be achievable.

Conclusion

Significant geologic hazards within the project area could be mitigated by prudent planning and construction.

PALEONTOLOGICAL RESOURCES

AFFECTED ENVIRONMENT

Two paleontological studies have been conducted near Consol's project area: 1) Townships 3 and 4 North, done in 1983 by Mariah Associates; 2) Piceance Basin south of Meeker, done by Lucas and Kihm (1982). Both studies considered the discovery of vertebrate fossils in the Williams Fork Formation to be of significant scientific value because of their rare occurrence.

Marine, freshwater, and brackish water invertebrates are frequently found in the Williams Fork Formation, along with occasional plant and vertebrate fossils (Mariah Associates 1983).

Dinosaurs existed during the time of deposition of the Williams Fork Formation, as evidenced by their tracks and fragmentary pieces of bone (Brown 1983). Full or even partial skeletal remains are rare (Mariah Associates 1983).

Since vertebrate fossils were found in the Williams Fork Formation, such fossils could be present in Consol's project area.

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

No development in the project area would prevent degradation of paleontological resources. However, potentially significant fossils would probably not be discovered.

Consol's Proposed Action

Development of coal by surface methods presents a likelihood that undiscovered fossils within the overburden and interburden would be destroyed. Therefore, the historical and biological information that could be gained from their study would be lost. However, development of coal also increases the chances of discovery of scientifically important fossils. Once discovered, these fossils could be protected.

BLM's Preferred Alternative

Under the preferred alternative, there would be no significant impacts after mitigation.

Conclusion

No significant fossils are known in the project area. However, a potential for discovery of such fossils exists.

VEGETATION

AFFECTED ENVIRONMENT

Vegetative communities in the project area include big sagebrush shrubland, mixed mountain shrubland, and aspen woodland. The communities comprise 96 percent of the area. Mountain grassland, riparian/wetlands, meadows, and agricultural land comprise 4 percent (Table 3-10).

Community	Acres	Elevation	Slope	Dominant Plants	Percentage Cover	Other Plants	Soil Type	Productivity (lbs/acre)
Big Sagebrush Shrubland	694	7200′ to 7800′	5-35%	Big sagebrush	40 overstory, 50 herbaceous	Kentucky Bluegrass, Columbia needlegrass, Junegrass, mule's ear	Owen Creek-Jerry-Burnette loams	1,328[b]
Mixed Mountain Shrubland	3,590	7600′ to 8400′	8-65%	Utah serviceberry, Gambel oak	50 overstory, 60 herbaceous	Variety of grasses and forbs	Jerry-Thornburg-Rhone	926[b]
Aspen Woodland	601	7300′ to 8600′	3-50%	Aspen	50 overstory, 50 to 80 overstory, 80 overstory	Chokecherry, various forbs and grasses	Rhone, Northwater	2,250[c]
Mountain Grassland	58	8200′ to 8600′	3-50%		50 herbaceous	Beardless wheatgrass, Junegrass, bluebunch wheatgrass, longleaf squirreltail	Waybe-Vandamore, Variant-Rock outcrop complex	350[c]
Wetlands	84	7000′ to 7600	0-5%	Willows	10 open water, 20 overstory, 70 herbaceous	Cattail, Nebraska sedge, field cluster beaked sedge, hair grass, foxtail barley spike rush, baltic bush	Owen Creek-Jerry-Burnett loams	
Meadows	94	7000′ to 7600′	0-5%		100%	Wildrye, spinnery Canadathistle, cutleaf cuneflower, stinging nettle, lupine, yarrow; or bluegrass, asters, dandelions, tarweed cinquefoil, sage	Owen Creek-Jerry-Burnette loams	2,707[b]

[a] CDM 1984a   [b] OSM 1982   [c] SCS 1982

Table 3-10 Vegetative Descriptions Within the PRLA

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

Under these alternatives vegetation would not be disturbed by mining.

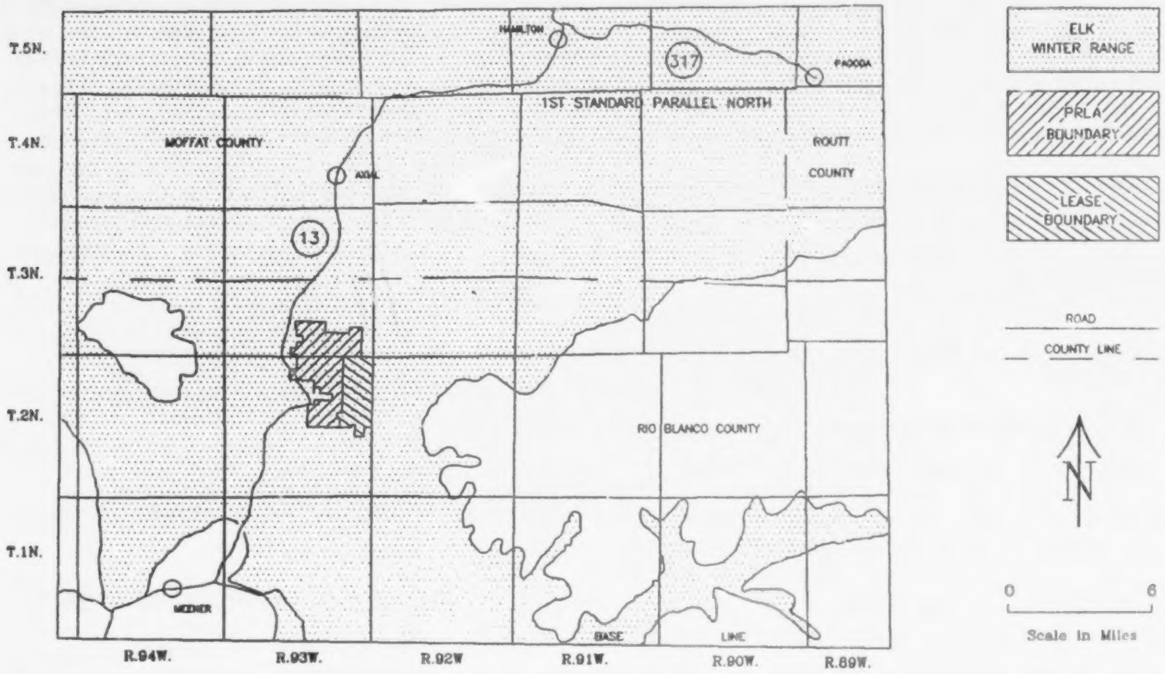
Development Alternatives

Up to a total of 5,200 acres of vegetation would be disturbed. Of this, only a maximum of 818 acres would be disturbed at any one time. Reclamation would follow on areas as the mine pit moved. Approximately 375 acres, to be used for ancillary facilities, would remain disturbed for the mine's life. Loss of the vegetation is considered mitigatable and not significant.

Another loss could occur from building a rail line up Good Spring Creek (outside the PRLA) and the attendant loss of approximately 152 acres of wetland meadows. Of this acreage, 100 acres are used for hay production. No mitigation has been proposed at this time for the rail line, because no proposal to build it has been received, and no permit for construction is under consideration.

Approximately 10 acres of agricultural land would also be lost at the loadout facility. This is considered mitigatable and not significant.

Direct impacts to vegetation in the wetlands and meadows would be insignificant; however, the resultant impacts to livestock and wildlife could be important (see Livestock and Wildife sections). During mine operations, about 28 acres, or 24 percent of the wetlands and meadows in James Creek, could be lost through haul road construction. Additional acres could be lost as a result of silt from the road. The action with the largest effect, would be the mining of the headwaters of James Creek. The alteration of the Williams Fork aquifer system at the headwaters could result in the loss of several portions of the wetland-riparian complex within the PRLA and adjacent lease (see Groundwater section). The functional attributes of


T.5N.
T.4N.
T.3N.
T.2N.
T.1N.
HAMILTON
317
PAGODA
1ST STANDARD PARALLEL NORTH
MOFFAT COUNTY
ROUTT COUNTY
AXIAL
13
RIO BLANCO COUNTY
MEEKER
BASE
LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W.
R.89W.
ELK WINTER RANGE
PRLA BOUNDARY
LEASE BOUNDARY
ROAD
COUNTY LINE
N
0
6
Scale in Miles

Map 3-7 Elk Winter Range (CDOW)

the riparian ecosystem would not be operational. Through time, riparian vegetation would be replaced by upland species such as sagebrush, rabbitbrush, and annuals. Mitigation of these impacts would depend on replacement of the water sources (see Groundwater section) and the reestablishment wetlands (Appendix C).

Use of sagebrush in revegetation should be avoided to prevent choking out other favorable plants.

There would be no impacts to threatened, endangered, candidate, or sensitive plant species.

Conclusion

Although the impacts to vegetation would not be significant when considered alone, impacts to wildlife and livestock, resulting from loss of habitat and forage, could be important (see Elk section).

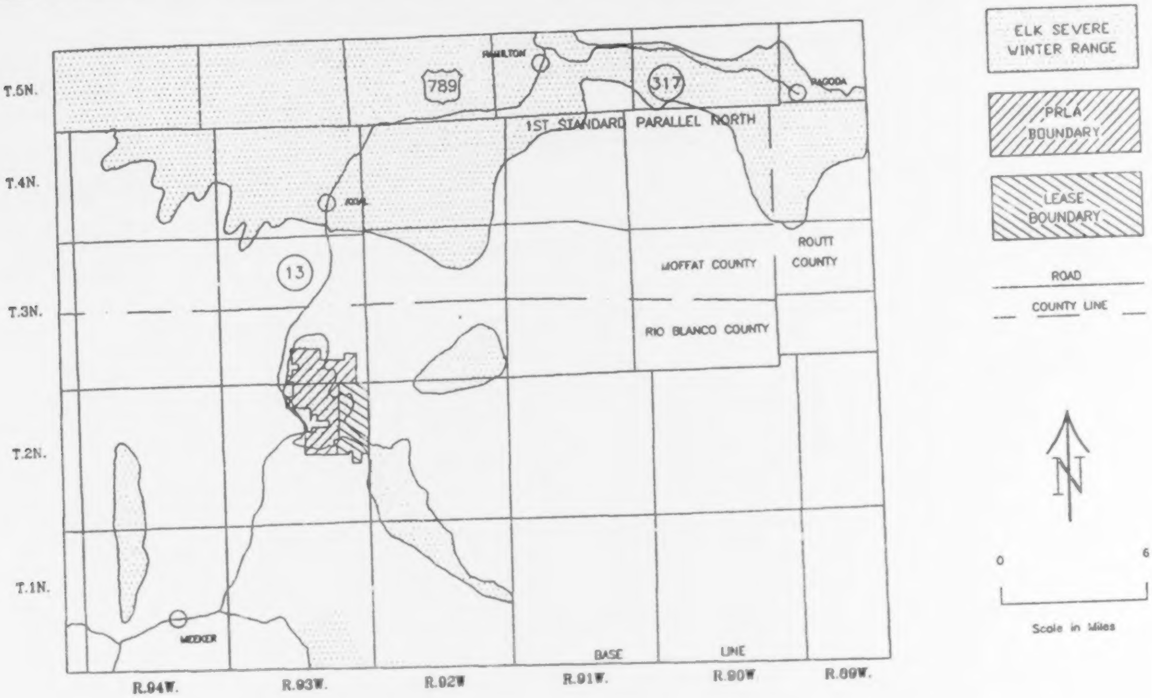
WILDLIFE

ELK

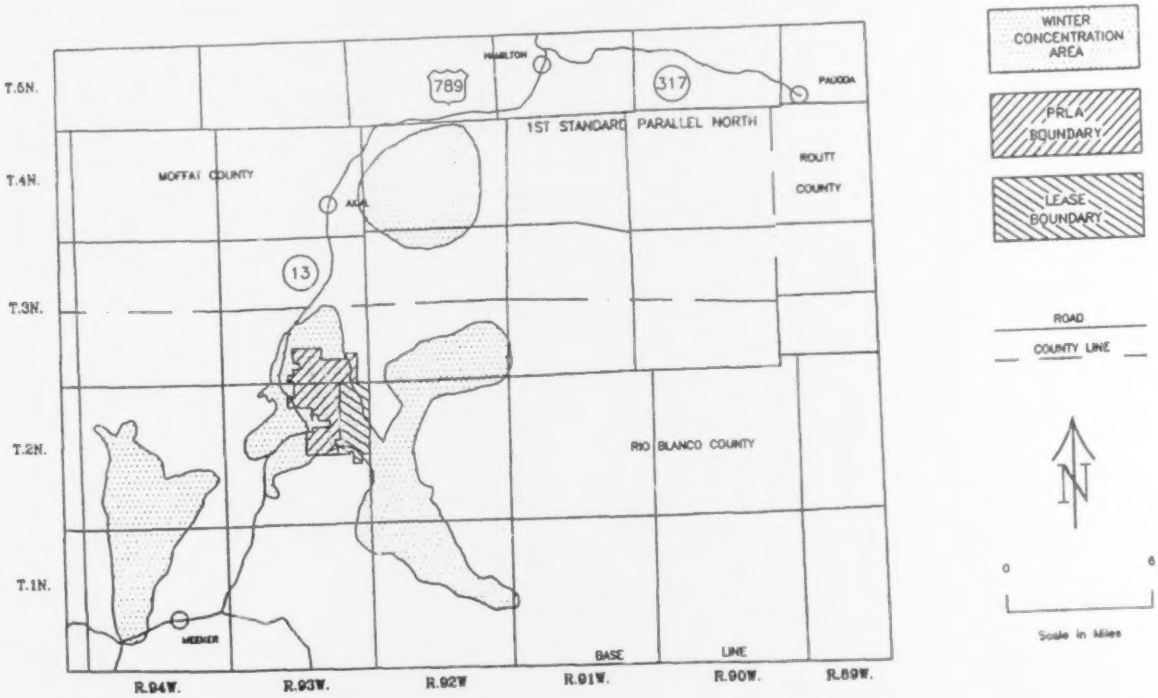
Affected Environment

Baseline studies (CDM 1984c, CDM 1985) confirm that elk calve, winter, and migrate through the project area. Patterns of seasonal elk use overlap the PRLA and adjacent Federal coal leases held by Consol. The Colorado Division of Willife mapping for elk winter range is shown on Map 3-7, elk severe winter range on Map 3-8, elk winter concentration areas on Map 3-9, and elk calving areas are shown on Map 3-10. Elk studies have been conducted in the area for the past several years by Dr. Baumann of Camp, Dresser and McKee (CDM) for Consol. He has provided several additional maps based on his observations during the studies. Elk severe winter range, winter concentration areas, and elk calving areas as provided by CDM are shown on Maps 3-11, 3-12, and 3-13 respectively. See Appendix D for vegetative types.

The data presented in the mapping varies between CDOW and CDM. The CDOW mapping generally presents a more conservative view than that of CDM. In either case, there would be an adequate land base suitable


T.5N.
T.4N.
T.3N.
T.2N.
T.1N.
HAMILTON
789
317
PAGODA
1ST STANDARD PARALLEL NORTH
AXIAL
13
MOFFAT COUNTY
ROUTT COUNTY
RIO BLANCO COUNTY
MEEKER
BASE
LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W
R.89W.
ELK SEVERE WINTER RANGE
PRLA BOUNDARY
LEASE BOUNDARY
ROAD
COUNTY LINE
N
0
6
Scale in Miles

Map 3-8 Elk Severe Winter Range (CDOW)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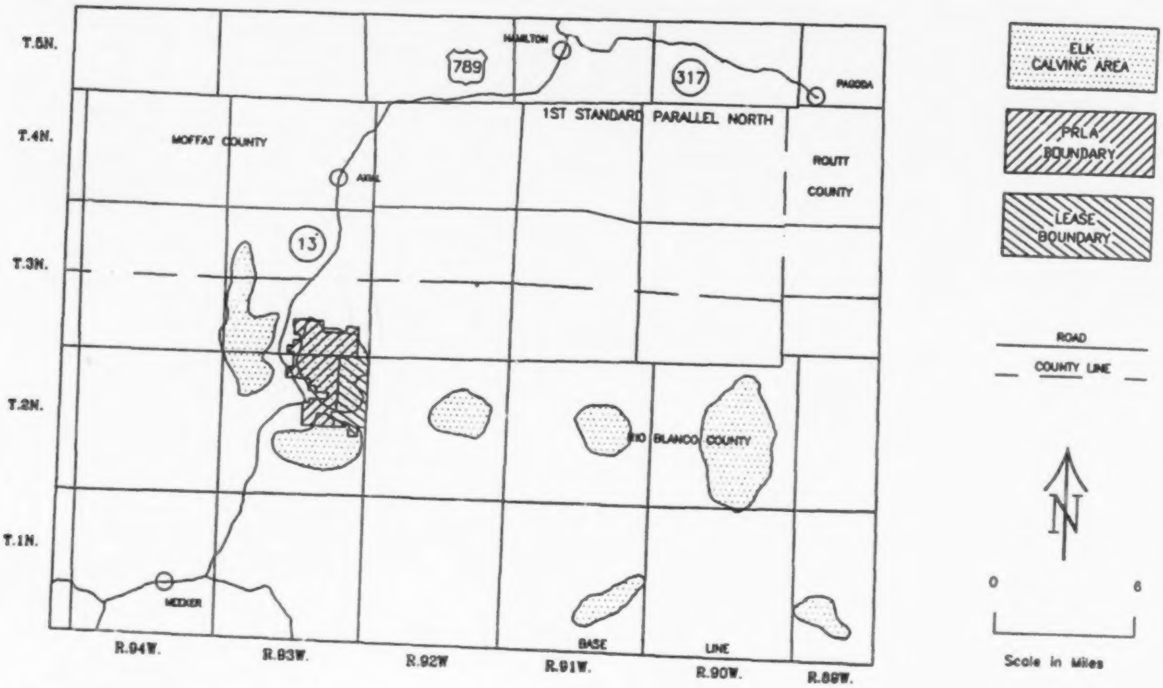
317
PAGODA
1ST STANDARD PARALLEL NORTH
MOFFAT COUNTY
ROUTT COUNTY
AXIAL
13
RIO BLANCO COUNTY
MEEKER
BASE
LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W.
R.89W.
WINTER CONCENTRATION AREA
PRLA BOUNDARY
LEASE BOUNDARY
ROAD
COUNTY LINE
N
0
6
Scale in Miles

Map 3-9 Elk Winter Concentration Areas (CDOW)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HAMILTON
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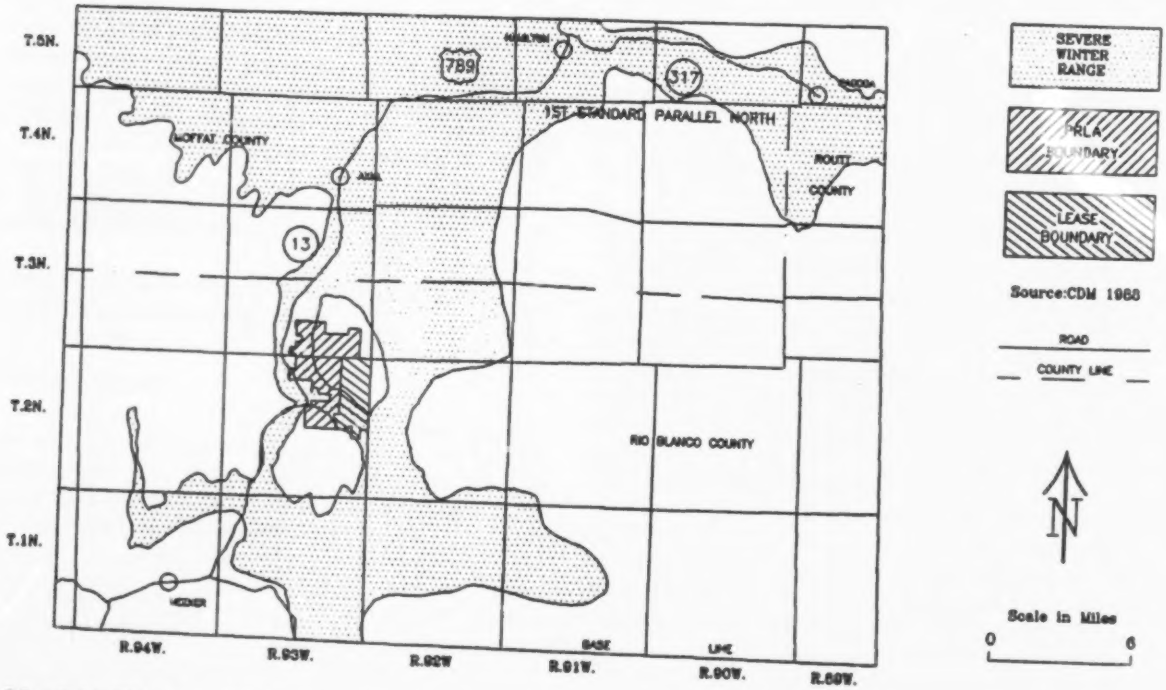
317
PAGODA
1ST STANDARD PARALLEL NORTH
MOFFAT COUNTY
AXIAL
ROUTT COUNTY
13
RIO BLANCO COUNTY
MEEKER
R.94W.
R.93W.
R.92W
R.91W.
BASE
LINE
R.90W.
R.89W.
ELK CALVING AREA
PRLA BOUNDARY
LEASE BOUNDARY
ROAD
COUNTY LINE
N
0
6
Scale in Miles

Map 3-10 Elk Calving Areas (CDOW)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HAMILTON
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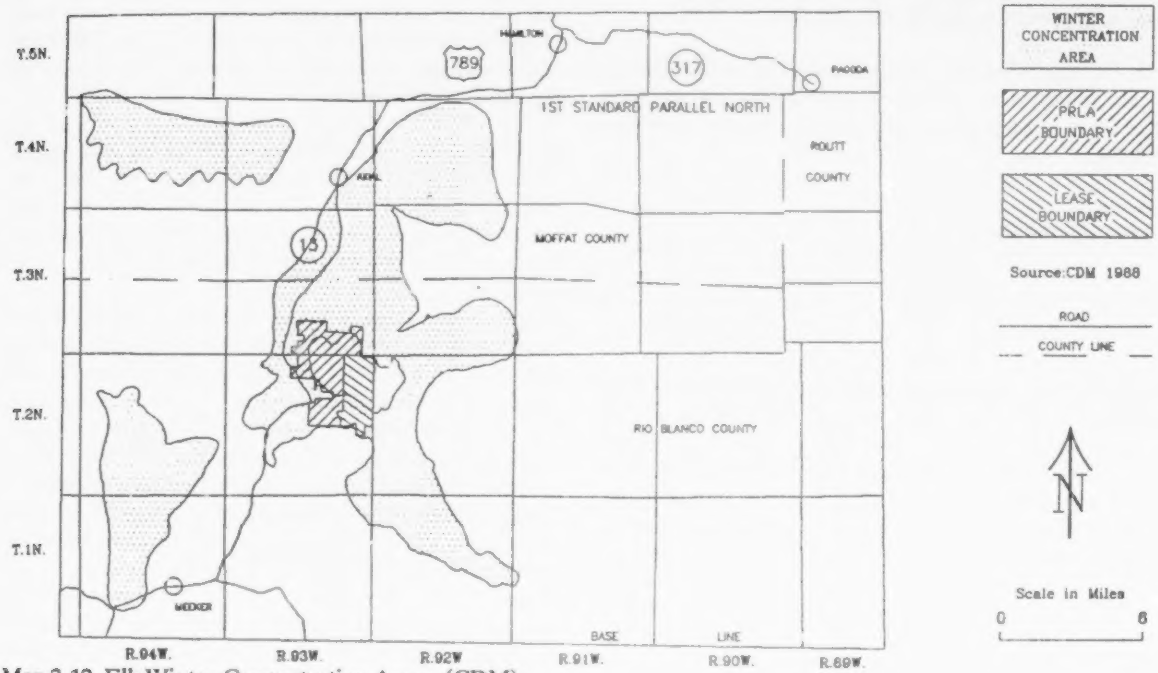
PAGODA
1ST STANDARD PARALLEL NORTH
MOFFAT COUNTY
AXIAL
ROUTT COUNTY
13
RIO BLANCO COUNTY
MEEKER
R.94W.
R.93W.
R.92W
R.91W.
BASE
LINE
R.90W.
R.89W.
SEVERE WINTER RANGE
PRLA BOUNDARY
LEASE BOUNDARY
ROAD
COUNTY LINE
N
Scale in Miles
0
6

Source:CDM 1988

Map 3-11 Elk Severe Winter Range (CDM)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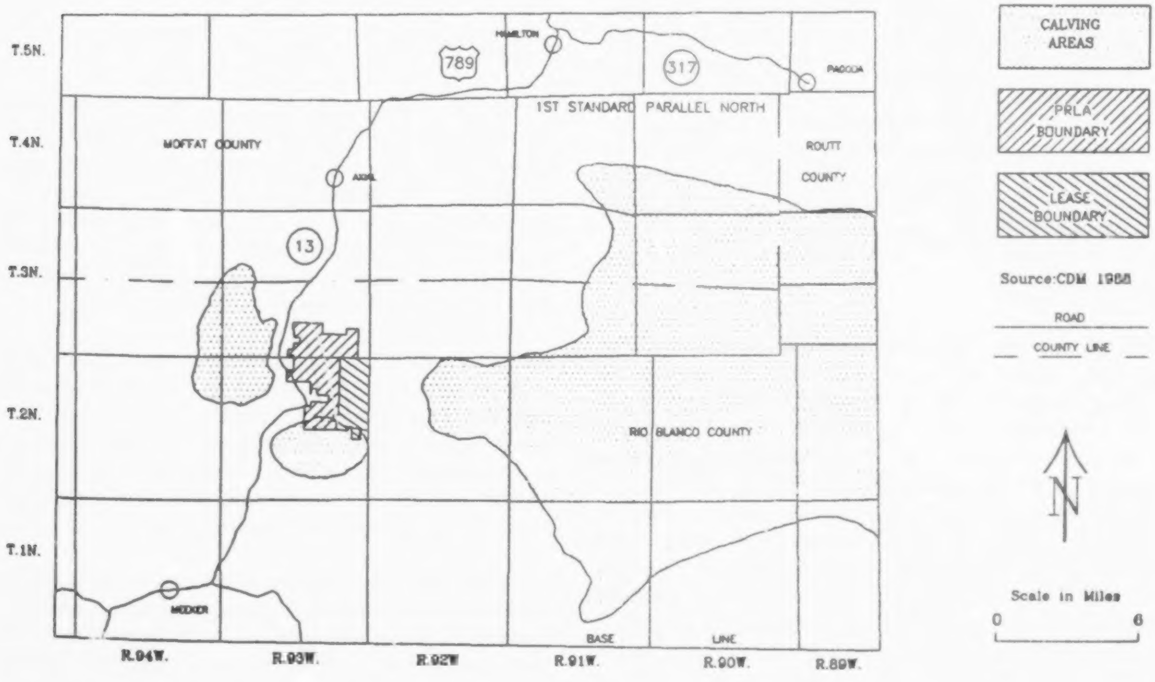
T.4N.
T.3N.
T.2N.
T.1N.
HAMILTON
789
317
PAGODA
1ST STANDARD PARALLEL NORTH
ROUTT COUNTY
AXIAL
13
MOFFAT COUNTY
RIO BLANCO COUNTY
MEEKER
BASE LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W.
R.89W.
WINTER CONCENTRATION AREA
PRLA BOUNDARY
LEASE BOUNDARY
Source:CDM 1988
ROAD
COUNTY LINE
N
Scale in Miles
0
6

Map 3-12 Elk Winter Concentration Areas (CDM)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T.4N.
T.3N.
T.2N.
T.1N.
HAMILTON
789
317
PAGODA
1ST STANDARD PARALLEL NORTH
MOFFAT COUNTY
ROUTT COUNTY
AXIAL
13
RIO BLANCO COUNTY
MEEKER
BASE LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W.
R.89W.
CALVING AREAS
PRLA BOUNDARY
LEASE BOUNDARY
Source:CDM 1988
ROAD
COUNTY LINE
N
Scale in Miles
0
6

Map 3-13 Elk Calving Areas (CDM)

for mitigation. Mitigation could alter the shape or location of a particular habitat classification.

Elk activity areas, as identified by CDM within the 66 square mile intensive study area, which includes the project area and surrounding areas, are broken down as follows:

Production	25%	10,304 Acres
Winter Concentration Area	34%	14,406 Acres
Severe Winter Range	17%	6,967 Acres

Calving Habitat

Baseline and monitoring studies conducted by CDM during the 1983, 1984, 1985, 1986, and 1987 calving seasons demonstrated that the project area is a portion of one of three discrete calving/rearing areas (see Map 3-13). The areas are satellites on the western edge of calving habitat, used by the main White River elk herd, which extends east from Yellow Jacket Pass to Lost Park. The suitability of these three calving areas appears to be linked to cover provided by higher elevations exposed to cooling winds and to aspen stands that provide escape from summer heat. Other characteristics contributing to the area's suitability include perennial water and availability of salt from livestock operations (CDM 1984b).

Little evidence exists that a given cow elk selects the same calving site year after year. However, there is evidence that cows may return to the same area for calving each year. Athough baseline studies by CDM suggest that it is not regionally unique, removal of the calving habitat within the PRLA and vicinity could cause a calving disturbance or displacement of up to 3 percent of the White River elk herd in Game Management Units 12, 23, and 24 as shown in Map 3-14. This could affect up to 300 animals within these 3 GMUs (CDOW 1985a).

Winter Ranges

Baseline studies (CDM 1984b) indicate that although the greatest concentrations of wintering elk occurred at elevations below 7,000 feet in Axial Basin and White River Valley during the winter of 1983-1984, no large concentrations of elk were detected within boundaries of the project area. During the winter of 1983-84, the majority of the project area was not available as winter range because of heavy snow cover. This was an extremely severe winter and is not indicative of a normal winter. Densities of elk recorded in the project area during intensive helicopter surveys, completed between December 1983 and April 1984, ranged between 1.1 and 3.9 elk per square mile (CDM 1984b). Elk were concentrated on south or west-facing mountain shrub slopes with less snow. The overlap of agriculture with elk wintering areas in Axial and White River basins indicated the importance of maintaining higher elevation winter ranges that could be used more intensively during open winters. More intensive use of higher elevations was documented during CDM's late winter and early spring elk monitoring in 1986 and 1987 (CDM, 1986; CDM, 1987).

Radiotelemetry studies during the 1984-85 winter suggest a low fidelity to winter range by those elk that were monitored (CDM 1985). The fairly extensive elk movement exhibited during the separate and combined hunting season may preclude any fidelity to a specific winter range.

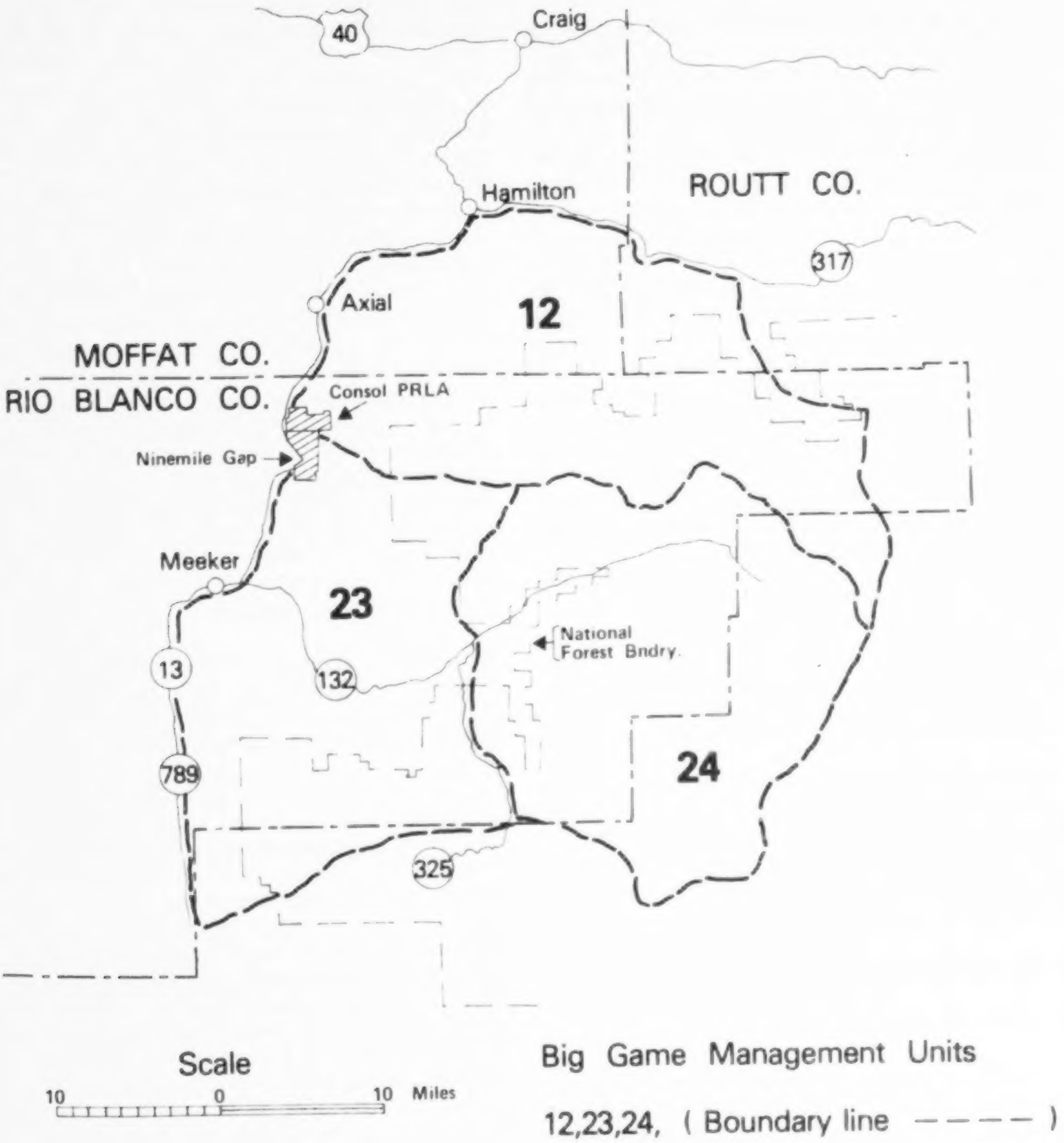
Many studies suggest that availability of quality winter range is the limiting factor controlling big game populations in northwest Colorado. CDM (1984b) identified the quality of transitional range (late fall-early winter, late winter-early spring) as a determinant of big game productivity, as documented by Verme (1969), Thorne et al. (1976), and Mautz (1978). Elk densities recorded during April 1983 (20 elk per square mile) and May 1983 (11 elk per square mile) suggested that the south-facing slope above Ninemile Draw was an important late winter/transitional range area (CDM 1984b). This baseline study and CDM's literature review indicate that maintenance and replacement of winter and transitional ranges within the project area are important to successful mitigation. Updated (1988) data from CDOW (CDOW 1988) confirms this. BLM considers the entire oakbrush-serviceberry ecosystem within the project area to be important transitional range.

Migratory Routes

The CDM (1984b, 1985, 1986, 1987) baseline studies in the vicinity of the PRLA suggest that movement from winter range to calving and summer ranges occurs as an elevational drift rather than as a movement through distinct corridors. Relocations of radio-collared elk showed several paths of movement through areas of minimal topographic resistance as potential migration routes of White River and Williams Fork elk.

Radiotelemetry results suggested that most elk wintering in the vicinity of the Meeker PRLA were migratory elk from the White River herd. Based on movements from winter range to calving and summer ranges, it appears that Ninemile Draw serves as one of many routes that the elk use to reach the Coal Creek, Milk Creek, and Lost Park calving, rearing, and summer ranges.

Although some elk trapped at the project area during winter moved across State Highway 13 to winter and summer ranges in the West Fork of Good Spring Creek and Hole-in-the-Wall, no evidence was found in 1983 and 1984 that Ninemile Draw is a major migratory route connecting winter ranges west of State Highway 13 and sum-


40
Craig
Hamilton
ROUTT CO.
317
Axial
12
MOFFAT CO.
RIO BLANCO CO.
Consol PRLA
Ninemile Gap
Meeker
23
13
132
National Forest Bndry.
789
24
325
Scale
10
0
10 Miles
Big Game Management Units
12,23,24, (Boundary line – – – –)

Map 3-14 Big Game Management Areas

mer ranges on the White River during the study years (CDM 1984b).

Radiotelemetry results during the 1984/85 winter throughout the region reinforce the suggestion that the Ninemile Draw/PRLA area is within one of several extensive migratory routes used by White River/Williams Fork elk. Comparison of 1984/1985 fall/winter movements of radio-collared elk indicate that many elk trapped in the Ninemile Draw/James Creek vicinity migrated via other routes to winter ranges remote from their 1983/1984 trapsite (CDM 1985).

The fairly extensive elk movement exhibited during the separate and combined hunting season may preclude any fidelity to a specific migration route, as well as a winter range.

"Skovlin (1982) concluded that the theory that elk repeatedly use the same migratory routes was well accepted by elk researchers and, based on the observations of Murie (1951), that this behavior was learned being passed from dam to calf. However, little direct evidence for this theory exists, and responses of elk to migratory routes can be expected tob e highly specific to characteristics of the terrain and the disturbance itself." CDM 1984b.

Radiotelemetry results (CDM 1984b) suggest that although the magnitude of movement through Ninemile Draw is not quantifiable, this area serves as a topographic funnel through which elk will move readily.

Use of Ninemile Draw as transitional range, as observed during April and May 1983, reinforces this conclusion. Elk movement between the Coal Creek Road and State Highway 13 was identified as a pattern that must be maintained to achieve successful mitigation of mining impacts (CDM 1984b).

Environmental Consequences

No Action/No Development Alternatives

No significant impact would be anticipated under these alternatives. The portion of the White River elk herd using the PRLA for calving would be undisturbed. Migration routes and winter use areas would also be unaffected.

Development Alternatives

This analysis assumes that the mitigation requirements of the proposed action and BLM's preferred alternative will be enforced. The impacts presented are those which may remain after mitigation. During the projected 30-year life of the mine, vegetation would be removed from approximately 5,200 acres. Approximately 73 percent of this area is dominated by mountain shrub, which is comprised of serviceberry, snowberry, Gambel oak, and sagebrush. Aspen stands are found on approximately 22 percent of the project area. These stands are particularly important for summer range and calving. Removal of this mountain shrub community would displace elk to adjacent browse areas. This might result in overutilization of some off-site use areas.

Approximately 75 percent of the PRLA (not the project area, but just the PRLA) is used by 65-100 elk for calving. The elk displaced by mining would be forced to move to adjoining calving areas on and off the project area. It is not known if the elk already using the adjoining calving areas have achieved maximum threshold densities, and although they probably have not, the possibility exists. Threshold numbers in this case refer to the maximum numbers of animals that a particular habitat can support. If adjoining habitats were saturated, they could not accommodate additional cow/calf pairs, and elk would be displaced to lesser quality habitats. Roughly 75 percent (based on the CDOW data presented in Map 3-7) of the project area is a elk winter concentration area. The beginning of mine activity could force the elk onto adjoining winter areas that would, in turn, apply more pressure to these undisturbed areas.

If the quantity and quality of water in James Creek were lost or greatly decreased (see the Surface Water section), the project area would probably become much less desirable for calving and rearing during the spring and summer.

During mining at the project's south end, it is not known what disruption might occur during the spring-fall migration. Elk may avoid the disturbed areas and alter their patterns of winter range use.

Although off-site areas would be enhanced, no additional acreage would be created. While the land base would not be expanded, the area suitable for use could be expanded or improved. The end result would be a net loss of space on which to calve or survive the winter. The development alternative would disrupt elk calving areas, migration routes, and water sources. Forage could also be lost. However, if enhanced, the off-site areas might be expanded or support more animals per acre. Enhancement would increase units of production on adjacent lands. There appears to be an adequate land base in the vicinity to support calving when enhancement efforts are considered.

Conclusion

The off-site enhancement of winter/transitional range and calving areas proposed by Consol would satisfy the short-term mitigation requirements. Although no areas or acreages have been determined, Consol would be required to develop/enhance areas so that elk are dispersed, and do not overuse the enhanced areas. The total area treated would be approximately the same as that disturbed by mining activities.

Between short-term off-site enhancement and the required long-term reclamation, there would be minimal impact on the wintering or calving capability of the White River elk herd, and no contribution to cumulative impacts on elk are anticipated.

MULE DEER

Affected Environment

The project area is classified as summer range and is vital to deer. Deer's condition (amount of body fat) at the beginning of winter depends on the condition and productivity of the summer range. Aspen stands, which exist on 1,150 acres and comprise 22 percent of the project area, are an important component of summer range.

Mule deer are the most abundant large mammal within the lease area during the spring, summer, and fall. According to the Colorado Division of Wildlife 1041 Data, seasonal population and range estimates, the area is primarily summer range, with a density of 11 deer per square mile. Deer also use the James Creek area extensively during spring/fall movements. Maximum numbers occur in April and October when population densities may exceed 25 deer per square mile. Fawning occurs on these lands, but no discrete locations have been identified.

Winter snow accumulation restricts deer to south, west, and east-facing slopes at lower elevations. During the winter of 1983-1984, wintering mule deer in the PRLA study area were limited to east- and west-facing slopes above the Good Spring Creek valley bottom, sagebrush shrublands in the Elkhorn Creek drainage, and east facing sagebrush and juniper-pinyon woodland near the Elkhorn Creek-Milk Creek confluence. Aerial surveys indicated that deer were distributed in the juniper-pinyon woodland, sagebrush shrubland, and agricultural habitat types. Deer densities were highest in the south-facing canyons and slopes of the cliffs bordering the White River Valley to the south and in the Axial Basin north of the PRLA (CDM 1984a).

Environmental Consequences

No Action/No Development Alternatives

These alternatives would cause no impact. The acreage within the project area would remain undisturbed and would continue to be used as summer range, fawning areas, and migration routes.

Development Alternatives

The production of 10 million tons per year would encroach on a vegetative complex that is vital to the year-long well being of mule deer. Summer use is attributed to perennial water found in James Creek. At the beginning of mine operations, the headwaters of James Creek would be disturbed (see the Environmental Consequences section for elk). Disturbing the headwaters and eliminating or reducing the quality or quantity of the water supply could seriously damage the project area's summer range capacity.

Elimination of the mountain browse and aspen groves would cause dispersal to adjoining areas. This dispersal during the summer would remove approximately 11 deer per square mile from the areas of mine activity. As a result, two things could happen: (1) The 11 deer per square mile could move onto adjoining areas in the project area, thereby increasing the density of animals and competition for available forage; or (2) deer could move onto other areas outside the project area boundaries, resulting in an increase in animal density and competition for forage.

During the fall migration, mule deer might avoid areas compacted by surface mining activities and thereby alter their distribution among areas used traditionally as winter range. During spring and fall migration periods, 25 deer per square mile or more may use the project area and similar adjacent areas.

Conclusion

If food and cover were removed during mining, animals would be forced onto adjacent areas. This would increase competition for available forage. If James Creek's flow were disrupted, the area would become less effective for summer range. Mine workings would disrupt fall migration routes, resulting in less use of traditional winter use areas or causing deer to use new areas.

Between off-site enhancement and mitigations and required reclamation, there would be very little impact on the deer population's wintering or fawning capability.

RAPTORS

Affected Environment

Nine species of raptors were observed during CDM's field surveys of the project area and adjacent leases in 1984. Most common were red-tailed hawk and turkey vulture. Red-tailed hawks were observed primarily in mountain shrubland and aspen habitats; turkey vultures were found throughout the project area. Species less frequently found were Cooper's hawk, northern harrier, great horned owl, American kestrel, golden eagle, Swainson's hawk, and prairie falcon. Raptor nesting appeared to be concentrated in aspen groves. Virtually all wildlife habitats were used as hunting grounds.

Aerial and follow-up ground surveys of the project area for active raptor nests showed 13 red-tailed hawk nests, one Cooper's hawk nest, and one great horned owl nest (Map 3-15). All nests were in aspen or oakbrush stands. Brood counts of the red-tailed hawk nests showed one or two young per nest. The surveys revealed no cliff nests in the PRLA.

Nine active red-tailed hawk nests were observed on adjacent Federal leases. One red-tailed hawk nest and one great-horned owl nest, which were noted as active during April 1984 aerial surveys, have apparently been destroyed by a mudslide.

Twenty-three nests, which were mapped during baseline studies, were unattended, inactive, or nests of unknown species.

However, two active Cooper's hawk nests, two additional active accipiter nests, one active falcon scrape, one active prairie falcon nest, and two great horned owl fledglings were observed in sections 24, 25, and 35, located east of leases C-093714 and C-093715. Active and inactive golden eagle nests were recorded in the cliff habitat south and west of lease C-093715. Several additional active red-tailed hawk nests were seen in the 1-mile buffer zone around the project area and lease tracts. A vulture roost exists in section 12 of C-093713 (CDM, 1984a).

Environmental Consequences

No Action/No Development Alternatives

Under these alternatives, the 13 red-tailed hawk nests, and one Cooper's hawk nest, would remain undisturbed. It is not known what species, if any, inhabit the 23 nests listed as unknown, but they would also remain undisturbed.

Consol's Proposed Action

The 13 red-tailed hawk nests (which were active during the spring of 1984), one Cooper's hawk nest, and the 23 nests listed as unknown would be disturbed. Each site mined would become unavailable to the species using the site and the species would be forced to relocate. If the species relocated off the project area, no further disturbance would occur. However, if the species relocated their nest sites to suitable habitat within the unmined project area, relocation would again be necessary when mining started in that area.

BLM's Preferred Alternative

Under this preferred alternative, no significant impacts are anticipated because of the mitigation that will have to be developed in consultation with USFWS and CDOW.

Conclusion

Surface disturbance would eliminate nesting habitat for the raptors using the disturbed area. This area would be unavailable for nesting until adequate nesting habitat has been replaced. This should not significantly affect regional raptor populations.

GAME BIRDS AND WATERFOWL

Affected Environment

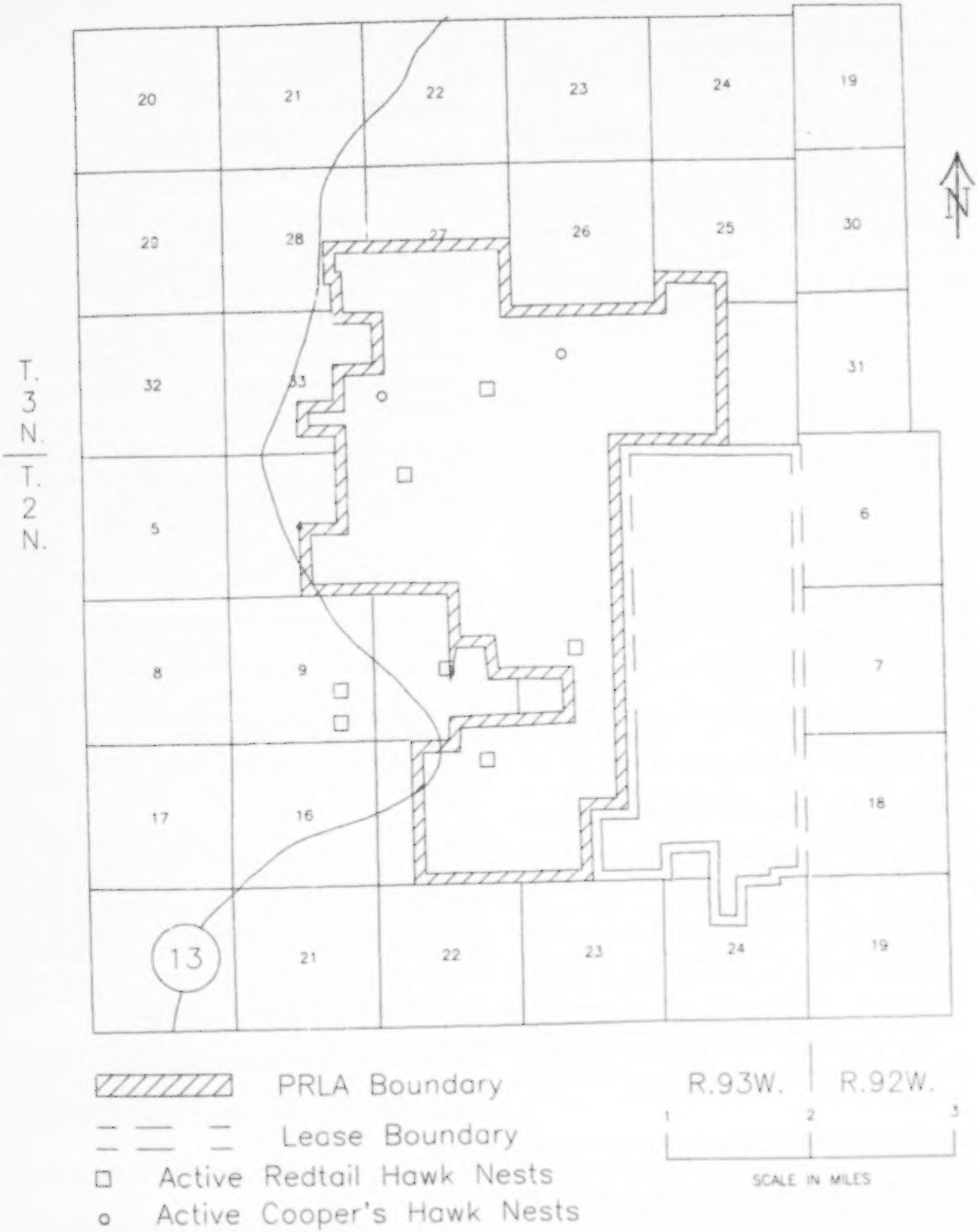
CDM (1984a) reports game birds, including blue grouse, sage grouse, and mourning dove, occur in the area. Many species of waterfowl may occur in the project area and vicinity as residents, breeders, winter visitors, or migrants.

Blue grouse and mourning dove were the most frequently observed gamebirds. Blue grouse were commonly found in mountain shrubland habitats; mourning doves were more widely distributed. Although not observed, sharptailed grouse may also occur in mixed shrub habitats of the area, but in relatively low numbers (BLM 1983 and Madison 1984).

Within the project area, territorial male blue grouse and hens with broods inhabit shrubland south of James Creek (sections 3, 10, and 11), and north of Ninemile Draw (section 14).

No sage grouse leks were observed on the tracts; however, one lek is located approximately 3 miles north of the PRLA in section 12.

In addition, flocks of two to four sage grouse were sighted in the sagebrush shrublands in the northern portion of lease C-093713 during summer 1983 and spring 1984.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18
13
21
22
23
24
19
N
T. 3 N.
T. 2 N.
PRLA Boundary
Lease Boundary
Active Redtail Hawk Nests
Active Cooper's Hawk Nests
R.93W.
R.92W.
1
2
3
SCALE IN MILES

Map 3-15 Raptor Nests

These flocks may be composed of individuals that used the lek north of the project area (section 12) and then moved to higher elevation shrubland habitats that offer superior forage and cover (Madison 1984). CDOW density estimates for sage and blue grouse in game management Unit 12, of which the PRLA is a part, are 13 to 21 sage grouse and five blue grouse per square mile (McKean and Trindle 1976).

Waterfowl species observed by CDM personnel during field surveys include mallard, green-winged teal, northern pintail, cinnamon teal, northern shoveler, American wigeon, ring-necked duck, lesser scaup, and American coot. Mallard, cinnamon teal, and ring-necked duck were by far the most abundant. Mainly individual citings were noted in the area. Almost all these were in aquatic areas or associated wetland vegetation.

Broods were observed in June and July in various ponds of the southern portion of the project area and vicinity. None were seen in the James Creek drainage during 1984, possibly because of the loss of suitable habitat from flooding and mudslides. Mallards were most frequently observed with young, in broods ranging from two to 14. Other species, with broods from two to nine, included green-winged teal, ring-necked duck, American wigeon, and cinnamon teal. Broods of mallard, cinnamon teal, and green-winged teal were recorded in the vicinity of the project area by Northern Coal in 1982 and P & M Coal Mining Co. in 1981 (CDM 1984a).

Environmental Consequences

No Action/No Development Alternatives

Under these alternatives, the waterfowl and game birds would not be disturbed.

Development Alternatives

Game birds would be forced to use other areas within and adjacent to the project area during mining. Disturbance or destruction of water sources would also force game birds to relocate. Providing new water sources during reclamation would provide for spring waterfowl use of the area. Sage grouse would also benefit from reclamation efforts, especially if preferred forb species were included in the seed mix.

Blue grouse habitat and blue grouse would be eliminated by mining disturbance until mountain shrub and aspen groves could be replaced. Mourning dove would be the primary beneficiary of the early reclamation effort.

Conclusion. Possible elimination of portions of James Creek as a perennial water source could make a major portion of the project area less desirable for game birds and waterfowl; however, mitigation would alleviate this problem. There would be no significant impacts to regional populations.

BEAVER

Affected Environment

James Creek is one of the principal habitats for beaver in the project area. During spring 1984 surveys, beaver activity was limited to the uppermost reaches of James Creek, a tributary of Good Spring Creek. One or two lodges appeared to be maintained in each of the activity areas. Evidence along James Creek showed that the unusual amount of spring 1984 runoff and mudslides contributed to siltation of ponds and breeching of dams. Beaver abandoned some areas.

Beaver mortality from recent flooding is unknown. However, a followup survey of the creek in summer 1984, after the spring runoff, indicated that beaver activity was minimal and confined to sites where beaver dam and lodges remained intact. Approximately 40 active beaver ponds were observed during this study (CDM 1984a).

The prevalence of older cuttings and dams in the valley supports Madison's observation (1984) that a larger population of beaver inhabited the James Creek drainage within the last decade. About 5 or 6 years ago, an epizootic plague (perhaps tularemia) decimated the population. Some of the dams along the creek have since fallen into disrepair and have been breeched (Madison 1984) (CDM 1984a).

Colorado Division of Wildlife's (1976) mapping in Rio Blanco County shows that beaver occupy most drainages. The location and degree of recent beaver activity in James Creek drainage from April to July 1984 suggest approximately 8.1 individuals per square mile for inhabited areas.

Environmental Consequences

No Action/No Development Alternatives

Under these alternatives, the beaver population would not be affected.

Consol's Proposed Action

Mining and reducing the quantity of water flowing in James Creek through the project area could cause the beaver to move to more available water. If the creek flow were not restored at the end of mining activities, the beaver population would probably never be replaced.

Beaver would maintain water control structures and would eliminate the need for man-made structures.

Allowing the haul road to parallel the creek channel would reduce the attractiveness of James Creek to beaver.

BLM's Preferred Alternative

Under the preferred alternative, there would be no significant impact because the creek channel would be protected from disturbance, or disturbance would be mitigated.

Conclusion

Any reduction in flow or degradation of James Creek would probably reduce or eliminate its beaver population. This would not be a significant regional impact. However, maintenance of water control structures by beaver might be preferred to the more costly efforts of man and might prove to be valuable for this reason, if protected.

FISH

Affected Environment

Local beaver ponds and James Creek can support several species of game and nongame fish (Madison 1984). A few species of chub and small suckers may occur in James Creek, and channel catfish occur in Lunney Reservoir. From 1980 to 1983, CDOW stocked the beaver ponds in the James Creek drainage with brook trout. However, the CDOW discontinued stocking in 1984 because of the spring 1984 flooding and poor condition of the beaver ponds. It is unlikely that any species of game fish exist in area ponds or in James Creek. Cattle and sheep grazing adjacent to the creek has reduced water quality, making survival of the cutthroat trout in the drainage doubtful (Madison 1984).

Most streams and ponds in the project area and vicinity are insignificant fisheries (personal comm., DOW 1985). No threatened and endangered (T&E) fish species are known to exist in the project area.

Environmental Consequences

No Action/No Development Alternatives

Fish would not be affected under these alternatives.

Development Alternatives

Lower water quality and quanity would render fish habitat unsuitable.

Conclusion

Lowering of water quantity or quality would make James Creek unsuitable for fish. This would not be a significant impact because no major populations are known to exist.

THREATENED AND ENDANGERED SPECIES

Affected Environment

Threatened and endangered species in the general area include the federally listed bald eagle, black-footed ferret, peregrine falcon, and whooping crane. However, neither black-footed ferrets nor white-tailed prairie dogs, their principal prey, have been observed in the project area. The closest prairie dog colonies occur several miles northwest of the PRLA and would not be impacted by the proposed development. The area impacted is not suitable prairie dog habitat.

The peregrine falcon does not nest or hunt in the project area (CDOW 1978). However, one falcon was sighted during the summers of 1974 and 1975 near Mount Streeter, located several miles northwest of the project area (BLM 1976). No peregrine falcons were observed in the project area and vicinity during 1984 aerial and ground surveys (CDM 1984a).

Bald eagles are commonly observed during the winter in riparian habitats along the White River. Although bald eagles have not been observed hunting or nesting in the project area, they occasionally hunt near Rattlesnake Mesa, south of the project area, and regularly feed in the Milk Creek drainage northwest of the project area.

The lower Milk Creek drainage is considered a winter concentration area and has been identified in the White River Management Framework Plan, Coal Amendment, 1981, as unsuitable for surface occupancy.

The project area lies within the migration corridor of the federally endangered whooping crane and state-endangered greater sandhill crane. Since key staging areas for these species are found along large rivers where small grain crops are available as food (CDOW 1978), the occurrence of sandhill or whooping cranes near the project area is unlikely. Individuals observed in the area are likely to be migrants (Hollowed 1984) (CDM 1984a).

Environmental Consequences

All Alternatives

No known threatened or endangered species are found within or adjacent to the project area. Therefore, no such species would be affected by any of the alternatives. Development would occur within the Yampa River Drainage. Several T&E species do exist about 15 miles north of the PRLA in the Yampa River. These are the Colorado squawfish, the humpback chub, and the bonytail chub. These species will not be directly affected by devleopment. While indirect effects are not anticipated, the possibility remains that a small depletion in flows to surface waters could occur (see the Surface and Groundwater sections). It is the policy of the Fish and Wildlife Service, as relayed to BLM, that any unmitigated depletion in flow in the Upper Colorado River System may cummulatively affect T&E fish species. (This includes depletions of less than one cubic foot per second.) Therefore, a stipulation requiring a compensation for any loss of flow has been added to BLM's preferred alternative to preclude an jepardizing of these species.

The same measure would be applied under the proposed action during the permitting process. In either case, no threatened or endangered species are expected to be impacted.

LAND USE

JENSEN STATE WILDLIFE AREA

Portions of the project area underlie the Colorado Division of Wildlife's Jensen State Wildlife Area. The Colorado Division of Wildlife (CDOW) has been involved throughout the analysis process. About 4,200 acres of the surface estate of the PRLA and adjacent Federal lease are part of the Jensen State Wildlife Area (SWA), and high elk habitat values exist in the project area. About 2,200 acres of the Jensen SWA would be disturbed under the development scenarios. CDOW has participated in the development of the proposed lease stipulations, and will continue to be involved as a surface owner. Both the proposed action and BLM's preferred alternative, provide for mitigation of wildlife habitat. In addition, BLM's preferred alternative would provide for public hunting opportunities lost through development of the PRLA.

Land ownership on the PRLA and adjacent federal leases is shown on Map 3-16.

GRAZING

Affected Environment

Land within the project area is used primarily for range and agriculture (Table 3-11). Along with 5,081 acres of rangeland, 15 acres of nonirrigated pasture occur on the Jensen property, which are not considered to be prime farmland.

Part of one Federal grazing allotment is in the project area. There are 4,774 acres in this allotment, of which 4,200 acres are private and 574 acres are lands administered by BLM. The allotment is grazed from June through October by 2,500 head of sheep. There are approximately 2,350 AUMs on the allotment, 164 of which are Federal.

Non-Federal surface lands within the PRLA boundaries are owned by Harry Kourlis, the Jensens, and the Division of Wildlife, as shown in Table 3-12 and Map 3-16. Land use types are shown on Table 3-11.

Landownership is displayed in Map 3-16. No rights-of-way occur on Federal surface within the PRLA (Map 3-17). Approximately 21 Federal oil and gas leases exist on or adjacent to the PRLA.

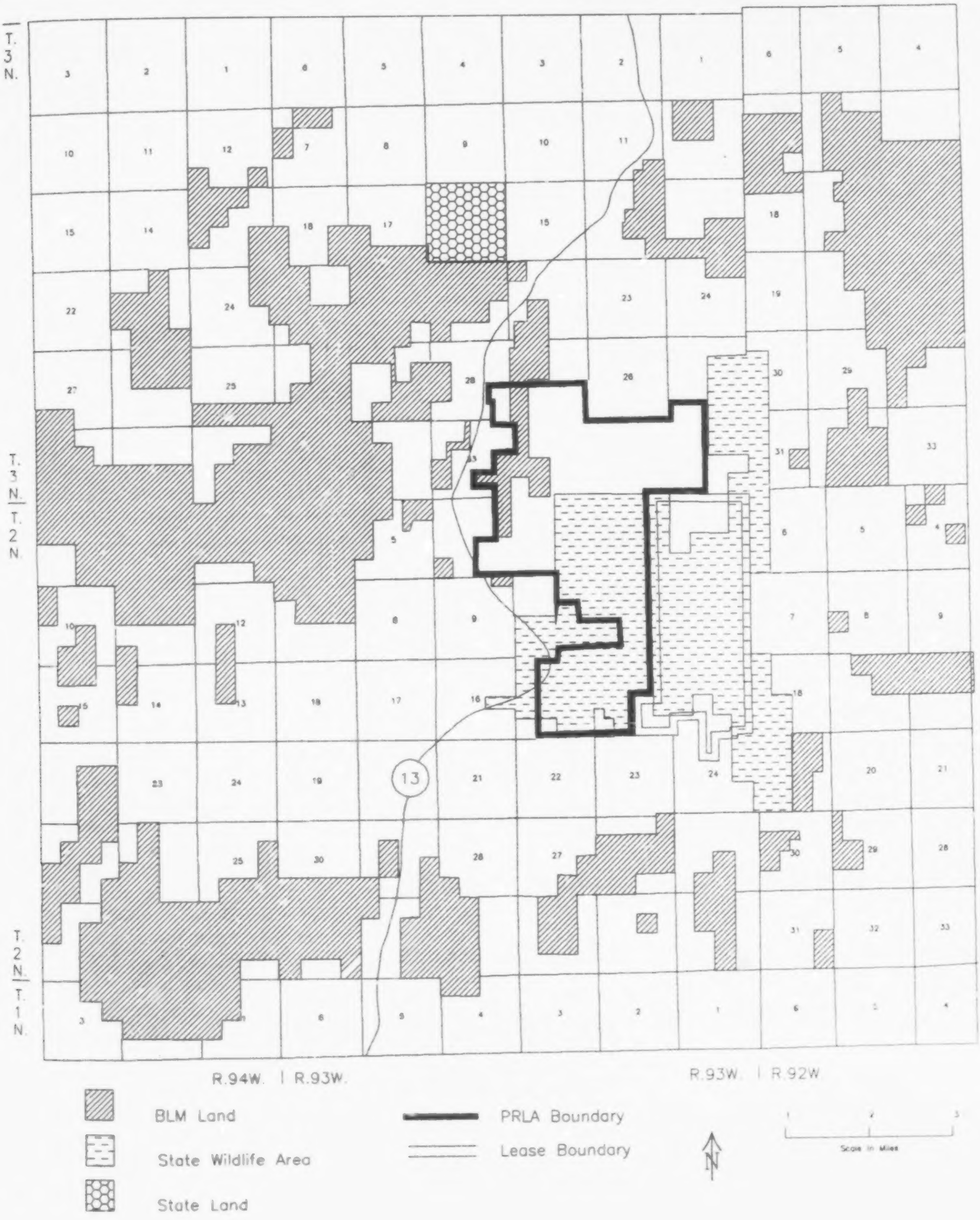
Approximately 85 percent of the PRLA surface estate is nonfederally owned. State Highway 13/789 passes through the southwest portion of the PRLA, and the Rio Blanco County (RBC) Road 30 passes through the tract. White River Electric Association's 7.2 kV powerline (C-0112683) parallels

Land Use	Acres	Percentage of Total
Rangeland	5,081	99.6
Agricultural	15	0.3
Residential (residence not occupied)	3	0.1

Table 3-11 Acreages of Land-Use Types Within the PRLA

Owner	Acres
BLM	560
Private	2,289
Division of Wildlife	2,250
Total	5,099

Table 3-12 Approximate Acreages of Landownership Within the PRLA


T. 3 N.
T. 3 N.
T. 2 N.
T. 2 N.
T. 1 N.
13
R.94W. | R.93W.
R.93W. | R.92W.
▨ BLM Land
State Wildlife Area
State Land
PRLA Boundary
Lease Boundary
N
1
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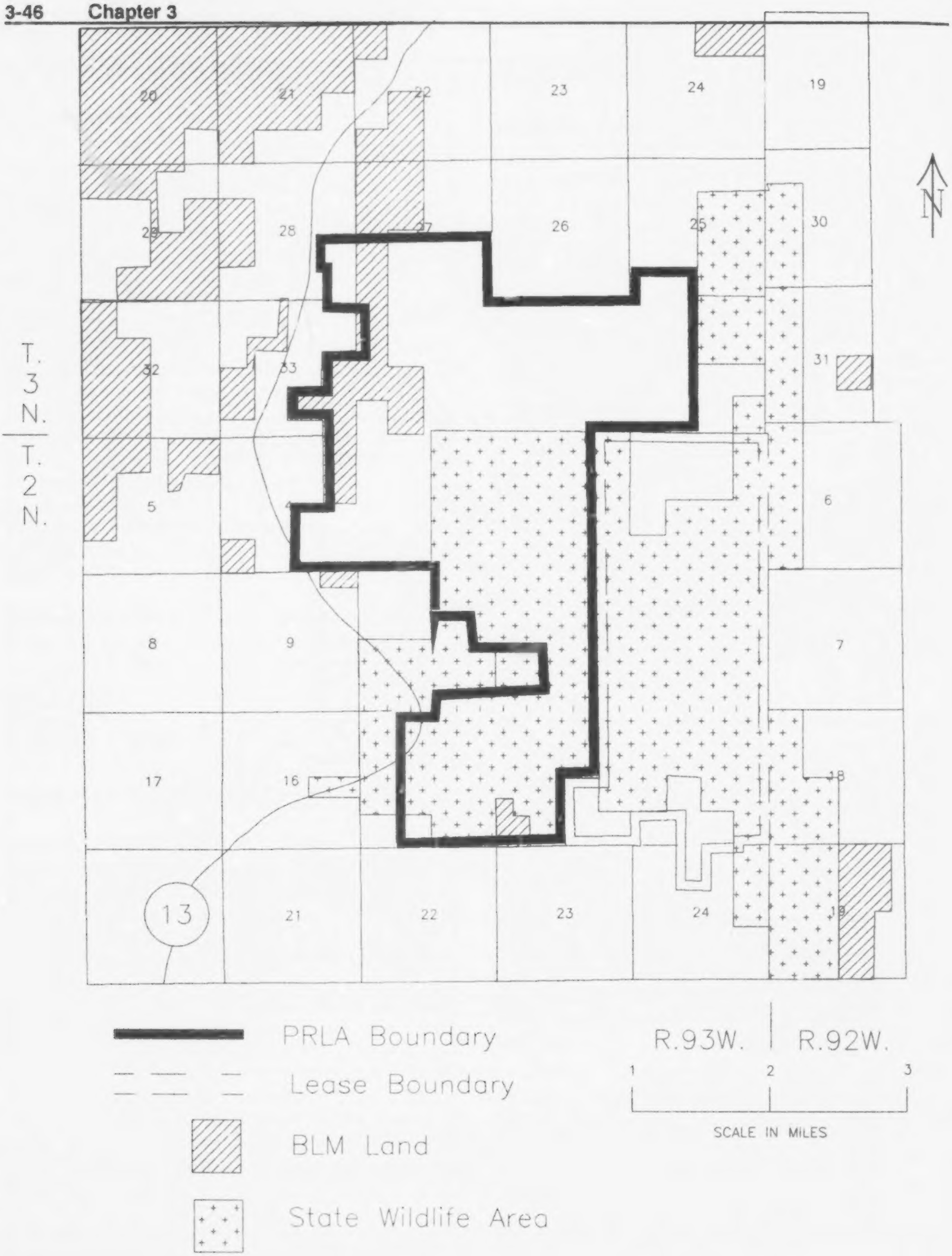
3
Scale in Miles

Map 3-16 Surface Ownership on the PRLA (1/2)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PRLA Boundary
Lease Boundary
BLM Land
State Wildlife Area
R.93W.
R.92W.
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SCALE IN MILES
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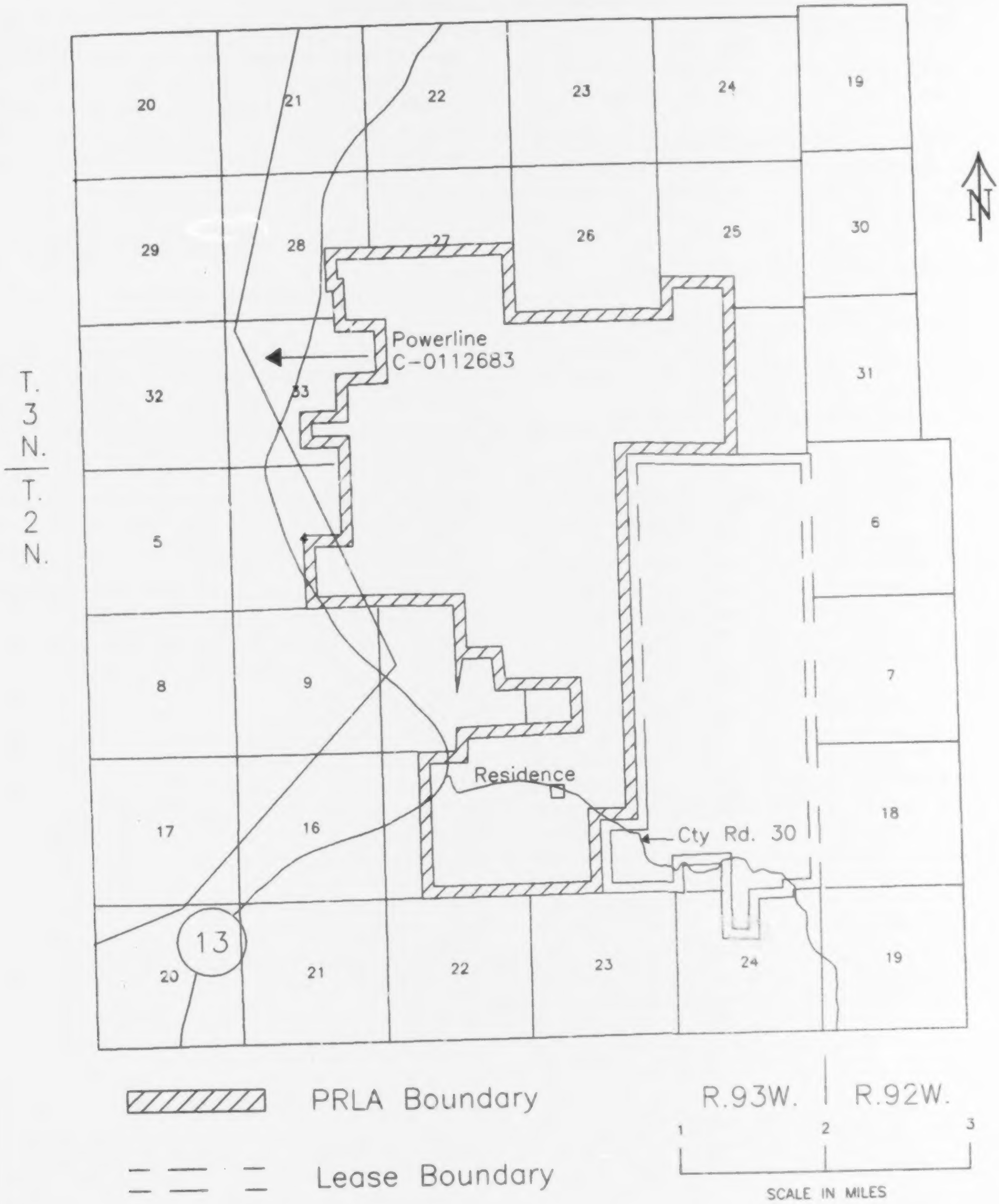
Map 3-16 Surface Land Ownership on the PRLA (2/2)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26
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30
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Powerline
C-0112683
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33
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T.
2
N.
5
6
8
9
7
Residence
17
16
Cty Rd. 30
18
13
20
21
22
23
24
19
PRLA Boundary
Lease Boundary
R.93W.
R.92W.
1
2
3
SCALE IN MILES

Map 3-17 Existing Structures and Rights-of-Way

State Highway 13/789, with a smaller powerline connecting the residence along RBC 30.

Because the rights-of-way are outside the area currently proposed for mining, no conflicts are anticipated.

The only state or local land-use plan in this area is the Rio Blanco County Master Plan, which was completed in September 1976 and revised April 14, 1983. Nothing in this EIS conflicts with that plan.

Environmental Consequences

No Action/No Development Alternatives

No impacts would occur under these alternatives.

Development Alternatives

Both of the development alternatives would affect forage and water for livestock. Forage losses should not be important until the 23rd year of mine operation. From the 23rd through the 30th years of operation, half of the forage in the allotment (2,350 AUMs) would be unavailable. Although reclamation would restore this allotment to its present productivity, any losses of forage during the mine life would be irretrievable and important to the permittee.

There are 124 AUMs on 100 acres in the James Creek riparian area. It is important to the livestock operator as lambing grounds, as transition range during stockdrives, as summer forage, and as emergency forage and water during drought years. Most of the value of the allotment to the livestock operator would be lost under Consol's proposal. Although Consol would obtain surface rights to the private land and compensate the livestock operator, it is not known whether other suitable land could be found for the livestock operator or whether compensation would offset future losses in revenue. Unless the riparian area could be restored, this land might lose much of its value to future livestock operations.

The decrease in both water quality and quantity and forage production areas in the James Creek drainage would be important. This decrease would result from the transportation corridor along James Creek and the mining of perched aquifers. These changes might be permanent because mitigation would be difficult.

Under all other alternatives, existing rights-of-ways, structures, and mineral leases would conflict with PRLA development. Potential conflicts would be resolved through facility relocation, rights-of-way relocation, and landowner consent.

Conclusion

Important livestock forage and water would be lost if development occurred. Other uses such as lambing grounds, transition range during stockdrives, and emergency forage and water during drought years would be lost. The impacts would be important to the operation on the allotment.

CULTURAL RESOURCES

AFFECTED ENVIRONMENT

The type and distribution of cultural resouces found to date in the PRLA are typical of those found elsewhere in the Danforth Hills. The known cultural resources tend to be clustered along the southwest boundary of the PRLA and are either prehistoric limited activity sites or historical homesteads. Table 3-13 summarizes the cultural resource inventories conducted on the PRLA and Table 3-14 provides a summary of the known cultural resources in the project area. Appendix E contains a regional analysis, by inventory, of cultural resources. Three major site types have been identified on the PRLA: isolated finds, historical dwelling and prehistoric open lithic sites. A greater range of site types is known in the Danforth Hills (Table E-1, Appendix E). Based on the known density of cultural resources on the PRLA and in the Danforth Hills, it is likely that between 20 to 65 sites will be identified in the project area. Until all of the cultural resources have been identified, fully evaluated and consultation with the State Historic Preservation Officer (SHPO) completed, it is not possible to determine the number and kind of sites which will qualify to the National Register of Historic Places.

None of the sites has been evaluated for inclusion in the National Register of Historic Places. Three sites were recommended as potentially eligible and would require evaluation and mitigation if surface disturbnance occurred.

A series of rock alignments along James Creek have been identified but not recorded or evaluated. This work should be completed when the tract is inventoried.

All sites were clustered in locales suitable for habitation. However, it also appears that they were not year-round occupation sites but were seasonal and short term. The remains of human use are sparse.

Project Location			Acres Inventoried Within Tract	Cultural Resources Identified	Reference
T.	R.	Section(s)			
3	93	27,34,35	519	1 historical site, 1 prehistoric isolated find	Schwartz and Meacham 1980
2	93	2,3,10,11,12,14,15		Rock alignments along James Creek	
2	93	16	120	2 prehistoric and 1 historical site, 4 isolated finds	Henss and Anderson 1979
2	93	3,4,10,11,14	83	None	Hartley 1983
3	93	25,26,27,34,35,36	41	None	Ryan 1978
2	93	1,3,4,9			
2	93	13,14,22	65	None	Jennings and Sullivan 1977
3	93	22	10	2 historical sites	Christensen 1984
3	93	34	28	None	Tate 1980
Total			866		

Table 3-13 Results of Cultural Resource Inventories Conducted on the Tract

Site No	Site type	NRHP Recommendation	Mitigation Recommendation	Reference
5RB1220	Historical trash scatters	Not eligible	Avoidance, monitor construction	Henss and Anderson 1979
5RB1221	Open camp	Potentially eligible	Test excavate	Henss and Anderson 1979
5RB1222	Open camp	Potentially eligible	Test excavate	Henss and Anderson 1979
5RB1228	Historical isolated find	Not eligible	No further work	Henss and Anderson 1979
5RB1232	Prehistoric isolated find Historical trash scatter	Not eligible	No further work	Henss and Anderson 1979
5RB1235	Prehistoric isolated find	Not eligible	No further work	Henss and Anderson 1979
5RB1236	Historical isolated find	Not eligible	No further work	Henss and Anderson 1979
5RB2606	Historical road bed	Not eligible	No further work	Christensen 1984
5RB2607	Historical telegraph/ telephone line	Not eligible	No further work	Christensen 1984
5RB1924	Prehistoric isolated find	Not eligible	No further work	Schwartz and Meacham 1980
5RB1943	Historical structure Rock alignments	Not eligible Potentially eligible	Complete recordation Test excavate	Schwartz and Meacham 1980 Schwartz and Meacham 1980

Table 3-14 Cultural Resources Located in the Project Area

evaluation and mitigation if surface disturbance occurred.

A series of rock alignments along James Creek have been identified but not recorded or evaluated. This work should be completed when the tract is inventoried.

All sites were clustered in locales suitable for habitation. However, it also appears that they were not year-round occupation sites but were seasonal and short term. The remains of human use are sparse.

ENVIRONMENTAL CONSEQUENCES

Less than 20 percent of the tract has been inventoried and no sites have been evaluated for inclusion in the National Register of Historic Places. A full assessment of the potential impacts would not be possible until the cultural resource record has been completed. There are, however, some tentative projections for impact.

No Action/No Development Alternatives

Cultural resources in the project area would not be disturbed or destroyed by mining under these alternatives.

Development Alternatives

Under the Proposed Action, all cultural resources would be heavily impacted by mining. Under BLM's Preferred Alternative, required surveys and scientifically acceptable techniques of removal or avoidance of any cultural resources discovered prior to mining would decrease unintentional destruction.

The efficiency of the inventories would depend on topography, vegetative cover, and past land use at any particular site. Such factors would account for hidden and subsurface sites remaining undetected and unprotected. On a regional basis, the potential for destruction of unknown archeological sites would increase in proportion to the number of acres disturbed. However, the occurrence of sites in specific areas would vary in relation to its topography, land use, and environmental constraints.

Under both development alternatives, mining would open previously less traveled areas. Illegal collection and excavation or unintentional damage could destroy irreplaceable data. Vandalism would result in loss of information that might have otherwise been recoverable and applied through scientific research.

Conclusion

Although the impacts would result, because of mitigation they are not expected to be significant. Accidental destruction or loss of cultural resources could occur during any proposed surface-disturbing activities. Cultural resources could also be vandalized because of a large workforce and greater access into the area.

If a site were excavated to meet mitigative criteria, any data overlooked or not recorded would be permanently lost.

Activities that disrupt the integrity of a site would bias interpretation of the remaining evidence. Recreating earlier cultures and their adaptions to the environment would be difficult.

RECREATION

AFFECTED ENVIRONMENT

The PRLA encompasses approximately 2,400 acres of the Jensen State Wildlife Area. It is open to the public 41/2 months each year and offers viewing and hunting opportunties for deer and particularly elk. The area is used intensively during the elk season. On other portions of the PRLA, use is limited to those willing to pay landowners for hunting rights or for access to the 500 acres of public lands within the PRLA. The PRLA lies within Colorado DOW big game management units 12 and 23. According to DOW big game harvest statistics, unit 23 had the highest number of elk hunters and harvest of any other management unit in the state in 1982 and 1983. Unit 12 also receives extensive hunting use.

The PRLA has a relatively natural landscape diversity that is desirable for hunting activities. The recreational opportunities are classified according to: 1) the types of experiences that can be achieved from participation, 2) the variety of activities, and 3) different environmental settings. The primary determinant of these recreation opportunity classes is the setting. It describes the overall environment in which the recreation occurs, influences specific types of activities that can occur, and ultimately determines the resultant types of experiences that users can achieve. The setting is formulated using a number of factors such as remoteness, size, amount of landscape alteration or development, the number of recreational users and their noticeability, and management constraints.

Six broad types or classes of recreational opportunities have been recognized on a continuum or spectrum (Recreation Opportunity Spectrum) ROS, ranging from largely natural and low-use areas to highly developed and intensively used areas.

The PRLA encompasses mainly two types of settings that can be briefly described in the following general terms:

Semi-Primitive Motorized: Areas alongside or near four-wheel drive roads and trails, having mostly natural landscapes, where there are often evidences of other people but numbers seen remain low, and where management controls are evident but not dominant.

Rural: Areas alongside or near paved highways, or having heavily modified landscapes, where there may be considerable evidences or numbers of other people, and where management controls are easily seen.

The majority of the PRLA falls into the semiprimitive motorized ROS class. But the area along the State Highway 13/789 corridor is considered a rural setting because of the highway traffic or numbers of people.

Other than designated camping areas for hunters, there are no developed recreational sites within the proposed area.

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

Under these alternatives there would be no impact to recreation.

Development Alternatives

Intensive development associated with coal mining would change the recreational setting from semiprimitive motorized and rural to modern urban. The modern urban ROS setting can be generally described as encompassing areas alongside or near paved highways or where the natural landscape is dominated or replaced by man-made developments, where there are great numbers or evidences of other people, or where management controls are numerous and dominate.

Hunting/viewing opportunities within the PRLA and Jensen State Wildlife Area would be lost through the life of the project. The Jensen area, approximately 6,300 acres, would be unavailable to the public because of development and lack of access. The loss of acres of wildlife habitat from surface-disturbing activities would displace game animals, mainly elk, and would displace hunters to other areas. Under BLM's Preferred Alternative, areas would be made available to these hunters.

Off-site impacts would occur from increased train traffic through Little Yampa Canyon along the Yampa River. The recreational setting would not change; however, the traffic increase would be noticeable to users floating the river or hunting in the area. The quality of the recreational opportunities and the setting would diminish.

Areas with intensive development would change the recreational setting from semiprimitive motorized and rural to modern urban.

Conclusion

Even with rehabilitation, these areas might not revert to semiprimitive motorized settings, but would probably change to roaded natural or rural. Roaded natural ROS settings can be briefly described as areas alongside or near improved roads where pickups and sedans can be driven, having natural appearing but modified landscapes, where there are moderate evidences and numbers of other people, or where management controls provide a sense of security. Hunting opportunities would increase after the life of the project. Although the quality of the recreational opportunities and settings would diminish in the Little Yampa Canyon and on the PRLA, there would be no long-term significant impacts to recreation. Mitigation, in the form of nearby access, would help offset lost hunting opportunities as a result of development.

VISUAL RESOURCES

AFFECTED ENVIRONMENT

James Creek has an undulating landscape composed of ridges and valleys. Hillsides consist of broken rock particles and outcrops intermixed with dark green and gray mountain brush. Aspen pockets exist along drainage ways and mix with conifers on northern slopes. The valley floor is horizontal and flat, cut by a mountain stream that winds through a diverse riparian habitat.

The James Creek Valley is a Class II Visual Resource Management (VRM) area. In such areas, retention of the landscape character would be desirable. Any contrast should not attract attention.

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

There would be no impacts from these alternatives.

Development Alternatives

The proposed project would dominate the relatively natural landscape of ridges, landscape features, and stream and riparian habitat. Silos, conveyors, roads, open pit mining, equipment, powerlines, etc., would dominate the landscape and reduce the area's high visual quality. The VRM Class II objectives could not be met. Loadout facilities, the railroad spur, and portions of the area to be surface mined would be highly visible from the adjacent State Highway 13/789 corridor. Thus, the visual quality along 11 miles of the highway would diminish.

Conclusion

The VRM Class II objectives for the area could not be met and despite reclamation efforts, the area would not return to its original visual quality and result in an irreversible and irretrievable loss of the visual resource. Present technology limits the ability to economically imitate natural landforms and features such as rock outcrops. Long-term adverse impacts would occur along 11 miles of State Highway 13/789 corridor because of the rail spur and loadout facilities. Surface mining would decrease visual quality. Impacts would occur well beyond the life of the project.

ECONOMICS

ECONOMIC ASSUMPTIONS

To illustrate the continuing recession in the study area, the BLM has updated certain key indications in the affected environment sections. The years 1986 or 1987 (BLM has used the latest available data). Update on employment, population, labor income, housing unit, federal dollars generated, and agricultural earnings were selected as the most accurate and available data. The data presented in tables 3-15, 3-16, 3-21, 3-22, 3-26, and 3-27 indicate further and substantial economic decline in the study area. (Note the difference from 1984 to 1986). These trends are not rapidly expected to change.

Based on national demand and development, subsequent economic conditions could again duplicate those described when the Draft EIS was published in November, 1985. Because the impacts presently anticipated would be within those previously identified, economic forcasts are uncertain, and actual development in the future may vary greatly, the environmental consequences sections have not been updated. The material presented in the environmental consequences section identifies the highest level of reasonably forseeable impacts. Actual impacts might well be substantially lower.

This analysis presents the following scenarios for regional coal production in northwest Colorado.

1. **Current trends and conditions.** If the present economic conditions continued, coal production would not increase beyond 10 million tons per year by all mines in the region in 1984, or 13 million tons per year in 1988.

2. **No Action/No Development.** Regional coal production would increase to 20 million tons per year and other mines would capture the additional (over current trends and conditions) 10 million tons per year share of the market.

3. **Development of the PRLA.** Regional coal production would increase to 20 million tons per year and Consol would capture the additional (over current trends and conditions) 10-million-tons-per-year share of the market.

Impacts under the No Action/No Develoment alternatives would be slightly larger than those under Consol's proposal. This is based on the assumption that one operation with state-of-the art mining equipment employing 850 persons would be more efficient than many operations with older equipment employing 961 persons.

Impacts from Consol's PRLA development (at construction and at full production of 10 million tons/year), and No Action/No Development alternatives, were assessed against current trends and conditions, which includes the following:

- Basic agricultural labor, proprietors, and services in both counties.
- Basic construction, manufacturing, TCPU (transportation, communications, public utilities), trade, services, government, and nonfarm proprietors in Moffat and Rio Blanco counties.
- Oil and gas drilling and producton in both counties.
- Uranium production in Moffat County as of April 1983.
- Railroad activity in Moffat County.
- Operations data for Craig Power Plant units 1, 2, and 3.
- Construction and operations data for the Deserado coal mine and railroad, Rio Blanco oil shale lease tract C-a, Cathedral Bluffs oil shale lease tract C-b, Multi-Mineral nahcolite operations, all in Rio Blanco County and Bonanza Power Plant units 1 and 2 and the same data for the Eagle, Trapper, and Colowyo mines (all in Moffat County).

For the economic analysis, base projections were calculated for Rio Blanco and Moffat counties, using the preceeding activities selected from the Basic Activity System of the State of Colorado's Planning and Assessment System.

The energy crisis of the early 1970s and the push for greater energy independence had a severe social and economic impact on northwestern Colorado. Many communities were unprepared for accelerated social and economic change. Efforts to understand, analyze, or accommodate impacts were inadequate and inconsistent. No common methodology, data, and assumptions were used.

In 1982 the Planning and Assessment System (PAS) was created to analyze the cumulative social/economic impacts of oil shale, coal, and other energy projects and basic sector activities in counties in northwest Colorado. PAS is developing an assessment process that can respond quickly to changing circumstances.

3. Detailed economic assessments performed for single projects (and often for one of several phases of a single project) result in only a portion of the potential effects being explored at any point in time.

4. Methodologies and assumptions differ from one assessment to another, making transferability and comparability difficult or impossible. Often methodologies and assumptions are not fully described or documented.

Use of PAS affords a common base of methodology, data, and assumptions and still allows flexibility for local judgment. This system is, therefore, the basis of our methodology.

Coal development in northwest Colorado would cause significant economic impacts to the regions, especially in Moffat and Rio Blanco counties and the communities of Craig and Meeker. The consequences would include front-end capital spending requirements for new housing and community facilities, the loss of agricultural land to residential and commercial uses, competition for labor (which would be disadvantageous to local agriculture and business interests), and inflation of local housing costs.

Development of energy-related projects (not all of which are reasonable at present) could cause serious dependence on the energy-minerals industry. That dependence carries the risk of relatively large and sudden fluctuations in employment, income, and population. Changes in market demand and/or decisions of mining/energy companies headquartered elsewhere cause the fluctuations.

It may not be possible to sustain a viable economic base under the "boom-bust" cycles that have characterized the region's energy/mining development. Although the PAS model assumes the reasonableness of the baseline activities listed for 1985, based on current market conditions, accurate baseline projections cannot be made as far as 2000.

If any project assumed in the 1985 baseline is diminished or terminated, the cumulative impact projected as a result of the project would also be diminished or terminated.

The impacts of PRLA development that are presented and analyzed are based on employment data supplied by Consolidation Coal Company. A regional construction force of 300 in 1988 and 350 in 1989 is projected for this project. Other construction projects identified by the Planning and Assessment System, State of Colorado would be completed in 1988 and 1989. Consol's construction could employ 50 to 60 percent of this pool of construction workers; therefore, it is assumed that impacts would not be as large for the region as anticipated during the energy boom period. Out-migration or unemployment for both Rio Blanco and Moffat counties would be slowed. Therefore, 1991 was selected as a year that would more clearly indicate the nature of the impacts of change in the construction force. Impacts would result primarily from the operations work force that would increase from 417 in 1991 to 916 in 1995 and then decline to a constant 856 for the life of the project.

Significant impacts are defined, for the purpose of this analysis, as changes in population, housing, income, infrastructure, etc., greater than 10 percent.

EMPLOYMENT AND INCOME

Affected Environment

Since economic data is available only by county, economic analysis must be performed by whole counties. In this case Moffat and Rio Blanco counties, Colorado, would be impacted. No significant impacts are anticipated from the James Creek project to other counties.

Employment and income figures are based on the place of work and are more accurate because they take commuting into account. Both Moffat and Rio Blanco counties heavily emphasize mineral extraction and tourism, dominated by summer mountain recreation and fall hunting. Livestock production remains an important factor in both counties but is small compared to other developments. Coal is the leading extractive mineral in Moffat County; oil and gas leads in Rio Blanco County. Employment and income figures are shown by place of residence in Tables 3-15 and 3-16.

Growth and decline cycles characterize the region and produce large, frequent fluctuations in employment and labor income, especially in the construction and mining sectors.

Environmental Consequences

Employment

Tables 3-17 and 3-18 present impacts that would occur under the various alternatives. Impacts of a 10-million-ton-per-year operation would be less than under the No Action/No Development Alternative of the PRLA where many mines would produce the coal because of economics of scale (see Economic Assumptions).

Expansion of the labor force by 10 percent or greater would occur in 2000 in both Rio Blanco and Moffat counties, if coal production from all sources reached 20 million tons per year or more from northwest Colorado. Significant impacts could occur in Meeker in 1991 and in both Craig and Meeker by 2000. Impacts from Consol's

	Employment (Persons'	% of Total	1987 Employment Persons	% of Total
Moffat County				
Agriculture	483	6.8	341	7.5
Mining	817	11.4	512	11.3
Construction	756	10.6	268	5.9
Manufacturing	363	5.2	114	2.5
Trans., comm., utilities	524	7.3	386	8.5
Trade	1,362	19.2	838	18.5
Finance, ins., real est.	215	3.0	333	7.3
Services	771	10.8	480	10.6
Government	1,051	14.8	950	21.
Unclassified	773	10.9	312	6.9
Total	7,114	100	4,536	100.00
Percentage Unemployed	7.1			11.3 1/
Rio Blanco County				
Agriculture	263	6.4	212	10.0
Mining	1,429	34.8	420	17.7
Construction	280	11.4	96	4.0
Manufacturing	32	.8	21	.9
Trans., comm., utilities	229	5.6	222	9.2
Trade	337	8.2	312	13.0
Finance, ins., real est.	35	.8	31	.9
Services	202	4.9	238	10.1
Government	811	19.7	690	29.0
Unclassified	300	7.4	125	5.3
Total	3,898	100	2,367	100.00
Percentage Unemployed	4.9			7.5 1/

Source: Colorado Division of Local Government; Planning and Assessment System, and BLM Estimate 02/20/85 and 3/19/88

1/ Colorado Labor Force Review, Vol. XXV, No. 1, Jan., 1988

Table 3-15 Employment

Community	Labor Income	Per Capita Income	1987
Rio Blanco County	$182,849	$12,901	83,191
Meeker	39,594	16,463	N/A
Rangely	37,884	17,584	N/A
Moffat County	133,955	9,494	104,410
Craig	98,974	10,678	N/A

Source: Colorado Division of Local Government: Planning and Assessment System, 02/05/85.

1/ Labor income includes wages, salaries, and proprietors income.

Table 3-16 Labor Income (In Thousands of 1984 Dollars)

development over no development would not be significant.

Income

Significant changes in labor income could occur in the towns of Meeker and Craig, and in Moffat County in 1991. By 2000, there would be significant changes in Meeker and Craig and in Rio Blanco and Moffat counties. The impacts are significant because the labor income base expands from 4 to 18 percent in the region by the year 2000 from all coal development. Impacts from Consol's development over no development would not be significant. Tables 3-19 and 3-20 present impacts that would occur under the various alternatives.

HOUSING AND POPULATION

Affected Environment

Population

Uneven population distributions characterize the area. Moffat County's population concentrates heavily in the eastern part of the county, primarily in Craig. Settlement in Rio Blanco County clusters around Meeker and Rangely. Areas between the population islands consist of sparsely settled ranching country and unpopulated state or Federal land. Table 3-21 presents the population base for the region.

Total Coal Production by County	Total Employment	Impact Attributable to Development	Percentage Impact From Current Levels	Percentage Change From No Development
Year 1991				
Rio Blanco County				
Current conditions and trends	5,101			-1
Development of PRLA	5,329	228	4	
No development of the PRLA	5,379	278	5	
Moffat County				
Current conditions and trends	7,030			-3
Development of PRLA	7,449	419	5	
No development of the PRLA	7,648	618	9	
Cumulative				
Current conditions and trends	12,131			-1.8
Development of PRLA	12,778	647	5	
No development of the PRLA	13,027	896	6.6	
Year 2000				
Rio Blanco County				
Current conditions and trends	4,947			-1
Development of PRLA	5,453	506	9	
No development of the PRLA	5,509	562	10	
Moffat County				
Current conditions and trends	7,338			-4
Development of PRLA	8,119	781	10	
No development of the PRLA	8,545	1,207	14	
Cumulative				
Current conditions and trends	12,285			-3.1
Development of PRLA	13,572	1,287	9.4	
No development of the PRLA	14,054	1,769	12.5	

Table 3-17 County Employment (Persons)

Total Coal Production by Community	Total Employment	Impact Attributable to Development	Percentage Impact From Current Levels	Percentage Change From No Development
Year 1991				
Meeker				
Current trends and conditions	2,539			0
Development of PRLA	2,836	297	10	
No development of the PRLA	2,834	295	10	
Craig				
Current trends and conditions	5,170			-2.7
Development of PRLA	5,551	381	7	
No development of the PRLA	5,730	560	9.7	
Year 2000				
Meeker				
Current trends and conditions	2,521			-.3
Development of PRLA	3,052	531	17	
No development of the PRLA	3,052	531	17.3	
Craig				
Current trends and conditions	5,447			-5.4
Development of PRLA	6,164	717	11.8	
No development of the PRLA	6,556	1109	17	

Table 3-18 Coummunity Employment (Persons)

Total Coal Production by Community	Total Labor Income	Impact Attributable to Development	Percentage Impact From Current Levels	Percentage Change From No Development	Per Capita (Dollars)
Year 1991					
Rio Blanco County					
Current trends and conditions	125,527				16,215
Development of PRLA	131,365	5,838	4	-1	16,755
No development of the PRLA	132,686	7,159	5		16,171
Moffat County					
Current trends and conditions	132,757				10,179
Development of PRLA	143,353	10,596	7	-3	10,855
No development of the PRLA	148,524	15,767	10		11,117
Cumulative					
Current trends and conditions	258,284				12,426
Development of PRLA	274,718	16,434	6	-2	12,879
No development of the PRLA	281,210	22,926	8		13,040
Year 2000					
Rio Blanco County					
Current trends and conditions	120,441				16,142
Development of PRLA	133,866	13,425	10	-1	15,756
No development of the PRLA	135,459	15,018	11		15,767
Moffat County					
Current trends and conditions	138,930				10,749
Development of PRLA	158,969	20,034	12	-5	11,170
No development of the PRLA	169,833	30,903	18		11,539
Cumulative					
Current trends and conditions	259,371				
Development of PRLA	292,830	33,459	11	-4	12,723
No development of the PRLA	305,292	45,921	15		13,098

Table 3-19 County Labor Income (In Thousands 1984 Dollars)

Total Coal Production by Community	Total Labor Income	Impact Attributable to Development	Percentage Impact From Current Levels	Percentage Change From No Development	Per Capita (Dollars)
Year 1991					
Meeker					
Current trends and Conditions	62,767				20,098
Development of PRLA	72,146	9,379	13	+2	20,899
No development of the PRLA	70,652	7,885	11		20,060
Craig					
Current trends and conditions	101,862				9,814
Development of PRLA	111,714	9,852	8.8	+3.2	10,547
No development of the PRLA	116,534	14,672	12		10,938
Year 2000					
Meeker					
Current trends and conditions	62,800				19,892
Development of PRLA	78,501	15,701	20	+2	20,669
No development of the PRLA	77,133	14,333	18		20,086
Craig					
Current trends and Conditions	107,240				10,181
Development of PRLA	126,156	18,916	15	+6	11,009
No development of the PRLA	136,414	29,174	21		11,549

Table 3-20 Coummunity Labor Income (In Thousands 1984 Dollars)

	1984			1986		
	County	County Division	Community	County	County Division	Community
Rio Blanco County	6,398			5,791		
Meeker Census Division		3,723			2,901	
Meeker			2,405			1,789
Rangely Census Division		2,675			2,890	
Rangely			2,156			
Moffat County	14,109			11,934		
Craig C.C.D.		10,012			9,465	
Craig			9,100			8,321
Dinosaur-Maybell		918			474	
Unincorporated		3,179			760	

1/ Colorado Division of Local Government: Planning and Assessment System, and BLM Estimate. 02/05/85

Table 3-21 Current Population

Housing

Vacancy rates between 9 and 27 percent exist in communities in the region, indicating a housing surplus. Communities could absorb growth from 9 to 27 percent without significant impacts. Vacancy levels in Table 3-22 do not indicate either unit's physical condition or whether they are year-round or seasonal units.

	1984			1986		
County	Occupied[1/]	Vacant[2/]	% Vacant	Occupied	Vacant	% Vacant
Moffat						
Craig	2,947	340	12	4321	1482	34.2
Dinosaur	105	28	27			
Rio Blanco						
Meeker	1,039	162	16	2012	910	44.8
Rangely	807	72	9			

1/Sources: Colorado Division of Local Government: Planning and Assessment System.

2/BLM estimate based upon a survey of each city's planning department. 12/07/84

Table 3-22 Housing Units

Environmental Consequences

Population

Potentially significant impacts (expansion of the population base by 10 percent or greater) would occur by 2000 in both Rio Blanco and Moffat counties and also in Craig and Meeker from all coal development. Impacts from Consol's development over no development will not be significant. Tables 3-23 and 3-24 present impacts to the region.

Housing

Because of the large vacancy rates that are present in both Craig and Meeker, any influx of people to either community would most certainly absorb current available units. This conditioncould result in short-term housing stabilization of price, but long-term local inflation of housing as the supply dwindles to less than demand by the year 2000. Table 3-25 presents housing demand in 1991 and 2000.

Total Coal Production by Community	Population (Persons)	Impact Attributable to Development	Percentage of Impact	Percentage Change From No Development
Year 1991				
Meeker				
Current trends and conditions	3,123			
Development of PRLA	3,452	329	10	-1
No development of the PRLA	3,522	399	11	
Craig				
Current trends and Conditions	10,379			
Development of PRLA	10,592	219	2	-.5
No development of the PRLA		20854	2.5	
Year 2000				
Meeker				
Current trends and Conditions	3,157			
Development of PRLA	3,798	641	17	-.7
No development of the PRLA	3,840	683	17.7	
Craig				
Current Trends and Conditions	10,533			
Development of PRLA	11,459	923	8	-2.8
No development of the PRLA	11,811	1278	10.8	

Table 3-23 Community Population

Total Coal Production by Community	Population (Persons)	Impact Attributable to Development	Percentage of Impact	Percentage Change From No Development
Year 1991				
Rio Blanco County				
Current trends and conditions	7,741			
Development of PRLA	8,124	383	4	-1
No development of the PRLA	8,205	464	6	
Moffat County				
Current trends and conditions	13,041			
Development of PRLA	13,206	165	1	-1
No development of the PRLA	13,359	318	2	
Cumulative				
Current trends and conditions	20,782			
Development of PRLA	21,320	548	2.5	-3
No development of the PRLA	21,564	782	3.6	
Year 2000				
Rio Blanco County				
Current trends and conditions	7,461			
Development of PRLA	8,498	1,036	12	-1
No development of the PRLA	8,591	1,130	13	
Moffat County				
Current trends and conditions	12,924			
Development of PRLA	14,231	1,307	9	-3
No development of the PRLA	14,717	1,793	12	
Cumulative				
Current trends and conditions	20,385			
Development of PRLA	22,727	2,342	10	-2.5
No development of the PRLA	23,308	2,923	12.5	

Table 3-24 County Population (Persons)

Total Coal Production by Community	Housing Demand	Impact Attributable to Development	Percentage of Impact	Percentage Change From No Development
Year 1991				
Meeker				
Current trends and conditions	1,352		11	-1
Development of PRLA	1,507	155	12	
No development of the PRLA	1,538	186		
Craig				
Current trends and conditions	3,302		2.6	-.4
Development of PRLA	3,393	91	3	
No development of the PRLA	3,413	111		
Year 2000				
Meeker				
Current trends and conditions	1,380		17	-.7
Development of PRLA	1,659	279	17.7	
No development of the PRLA	1,677	297		
Craig				
Current trends and conditions	3,352		8.8	-2.7
Development of PRLA	3,670	318	11.3	
No development of the PRLA	3,783	431		

Table 3-25 Housing Units

Local Government Finances

Under all alternatives, increased coal producion in the region would be assigned to existing mines (see Economic Assumption section). As a result of this alternative, it is assumed that the region would increase coal production by a maximum of 10 million tons by the year 2000. If that occurred, revenue would increase at all levels of government. The operations would pay royalties to the Federal government and property taxes to the county government.

Employees and secondary businesses would pay property taxes, sales taxes, and other charges to the municipal and county governments. Severance taxes cannot be projected because the formula requires data in operating cost to determine taxable revenue; however, impacts would be large.

Preparation for economic impacts requires lead time. Local governments, departments, etc., would be informed of new plans and changes in plans by companies and Federal agencies as soon as possible. This would allow construction of additional infrastructure ahead of the demand or cancellation of preparations before they are irretrievably committed. Likewise, timing of Federal actions so that they do not occur simultaneously with other large private or public developments would minimize local growth and contraction problems.

The principal unavoidable adverse economic effects would increase the financial strain on the communities. Other adverse effects would be the aggravation of local inflation, especially in housing costs and local business, and difficulties in meeting wage competition from the mine and construction sectors. These unavoidable effects have no immediate and forseeable mitigative processes. In the long term, some effects could be mitigated, but to what extent could not be estimated.

Long-term impacts would be growth in the local labor force and economic infrastructure, both of which would benefit business and residents. However, the long-term risk of excessive economic dependence on a single industry would be increased.

Growth in population of about 2,300 would be irreversible, except at considerable economic and human cost. Commitment of economic resources to additional housing, commercial and industrial facilities and infrastructure would be irretrievable.

The Federal government would contribute monies to state and local governments to mitigate the effects of Federal leasing and landownership. The Federal Lands Policy and Management Act (FLPMA), Section 317 (a), provides that 50 percent of all monies received from sales, bonuses, royalties, and rental of public lands be paid to the state where the leased lands or deposits are located. Monies are to be used as the legislature of the state may direct; priority is given to state subdivisions socially or economically impacted by development of minerals leased under this act, as shown under the county in Table 3-26. Colorado Senate Bill 35 (1977) distributes the state's share:

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Category	Percentage Share
Public School Fund	25
Energy Impact Assistance Fund	15
Colorado Water Conservation Board	10
County Involved	50--up to $800,000

Year	County	Total Generated	State Share (50%)	County Share
1983	Rio Blanco	46,312,400	23,156,200	393,750
1983	Moffat	8,309,170	4,154,585	393,750
1985	Rio Blanco	32,355,802	16,177,901	452,219

Table 3-26 Dollars Generated

Any annual excess over $800,000 goes to the public school fund. Counties may also receive additional funds through project grants from the Energy Impact Assistance Fund or through other Federal programs. Table 3-26 shows 1983 monies generated in the two counties as a result of Federal leasing and the amount returned to state and local governments. Together, the two counties generated just under 55 million dollars in 1983, from rentals and royalties of public lands.

The counties' share of generated royalties and rentals is subject to 34-63 Colorado Revisal Statute, which places the 50 percent Federal return subject to distribution approval of the State legislature. Severance taxes imposed by the states are also used for economic and social mitigation. In addition, towns and counties have authority to impose zoning and to negotiate tax prepayment and other arrangements with industries for these purposes.

ECONOMIC IMPACTS ON OTHER RESOURCES

Affected Environment

Agriculture

Livestock production is the principal agricultural activity in both Moffat and Rio Blanco counties. Crop production is dominated by hay for livestock feed. Individual proprietor's average 1982 livestock and crop earnings averaged about $12,100 for Moffat County and $8,700 for Rio Blanco County (Table 3-27).

	County	Livestock Products	Crops	Total
1982	Moffat	$8,948	$3,194	$12,142
1982	Rio Blanco	$7,800	$ 914	$ 8,714
1985	Moffat	$8,312	$7,092	$15,413
1985	Rio Blanco	$7,254	$4,069	$11,323

[1] /Source: Bureau of Economic Analysis, Regional Economic Information System, 1983. BEA Farm Income and Expenditures. U.S. Department of Commerce, Washington, D.C.

Colorado Agricultural Statistics, 1980 Colorado, Dept. of Agriculture

Table 3-27 1982 Agriculture Earnings (In Thousands)

Wildlife

Hunting is the only significant economic activity on the proposed PRLA. In 1982, an estimated 89,000 nonresident hunter days were spent in Rio Blanco County. At an average of about $56, in 1980 dollars, for nonresident hunters (McKean and Weber 1978), the economic value to the county was approximately $4,950,000. No figures of actual hunter days are available for the PRLA; however, BLM estimates these days would be less than 1 percent of the total economic value for wildlife.

Local Government Finances

Area communities obtain most of their revenue locally. As shown in Table 3-28, local sources generate 71 to 94 percent of total community revenues. That means that the communities can be highly impacted by developments that affect their tax base. Area school districts depend less on locally generated revenues because of the state equalization formula. The only school district that obtains more than 70 percent of its funds locally is Rangely, because of its a high per capita assessed valuation from mineral development (Table 3-29).

Rough measures of local funding sources are provided by per capita figures on assessed valuation and retail sales. Larger communities generally have more substantial property tax bases, and community sales tax bases vary accordingly. The sales tax may account for up to 31 percent of total community revenues. Communities with strong retail sales bases generally have business or tourist centers that handle financial impacts better than other communities.

At present, the communities' abilities to increase revenue sources are restricted. State law imposes a 7 percent limit on annual increases in property tax revenues and a 4 percent ceiling on combined municipal and county sales tax rates. Since only Rio Blanco County presently has a sizable sales tax (2 percent), most communities within Rio Blanco County have some leeway to use revenues through

	Craig	*Dinosaur*	*Meeker*	*Rangely*
Source of Revenue 1984				
Local %	87	94	71	73
State %	9	4	23	21
Federal %	3	1	3	5
Other %	1	1	3	1
Assessed Valuation (1982)				
Total	$28,109	428	9,808	10,640
Per Capita	$ 2,810	670	4,078	4,935
Mill Levy	12.0	13.227	6.662	14.344
Sales Taxes (FY83)				
Total	$ 2,261	10	304	764
Per Capita	$ 266	30	126	354
Sales Tax Rate (%) (07/01/83)	2.0	2.0	0[2]	0[2]
Bonded Debt (12/31/82)				
General Obligation	$ 7,015	0	0	199
Revenue	$ 60	0	1,294	640
Remaining Bonding Capacity	[1]	$43	980	1,064

Sources: Colorado Division of Property Taxation, Eleventh Annual Report Colorado Division of Local Government, 1982. Local Government Financial Compendium Colorado Department of Revenue, Annual Report 1983

[1] Percentage of assessed valuation, less general obligation bonded debt. Percentages are: Community: 10% (3% of actual valuation which, at 30% assessment rate, equals 10% of assessed valuation) School Districts: 20%

[2] Receives county sales tax (2.0 percent) of revenue collected within city limits.

Table 3-28 Local Government Financial Data (Dollars in Thousands)

	Meeker School District	*Rangely School District*	*Moffat County School District*
Source of Revenue (1984)			
Local %	68	95	67
State %	28	4	29
Federal %	4	1	4
Assessed Valuation (1982)			
Total	$45,970	417,280	288,703
Per Capita	$12,347	155,992	20,080
Mill Levy		$ 11.68	25.91
Sales Taxes	N/A	N/A	N/A
Sales Tax Rate	N/A	N/A	N/A
Bonded Debt (000)			
General Obligation	$ 0	0	7,470
Revenue	$ 1,068	0	
Remaining Bonding[1] Capacity	$18,125	83,456	50,271

Sources: Colorado Division of Property Taxation. Eleventh Annual Report Colorado Division of Local Government, 1982 Local Government Financial Compendium Colorado Department of Revenue, Annual Report 1983

[1] Figures include enterprise funds (water, sewer, etc.), but exclude large one-time federal grants.

Table 3-29 Local School District Financial Data (Dollars in Thousands) (1984)

county sales tax. The state equalization formula controls school district property tax revenues.

Figures on remaining bonding capacity in Tables 3-28 and 3-29 indicate: (1) how much major capital improvement could be funded from local sources, and (2) the size of the existing debt burden. State law imposes the ceilings shown in the footnotes. All communities and school districts have more than half of their bonding capacities still available for use and can meet low to moderate growth levels. These amounts, however, would be insufficient to meet major economic growth in Meeker and Rangely.

Environmental Consequences

Agriculture

On a county-wide basis, effects of development on agriculture would be insignificant. Combined reductions in agricultural earnings from loss of grazing land and conversion of irrigation water and cropland to industrial and urban uses would total no more than 1 percent of the total economic value for agriculture.

Wildlife

Smaller wildlife populations would decrease hunting opportunities and would reduce spending by hunters by approximately 1 percent in only Rio Blanco County.

Local Government Finances

The increased regional coal production would be assigned to existing mines and/or Consol (see Economic Assumption section). As a result, the region would increase coal production by a maximum of 10 million tons by 2000. If that occurred, revenue would be increased at all levels of government. The operations would pay royalties to the Federal government and property taxes to the county government.

Employees and secondary businesses would pay property taxes, sales taxes, and other charges to the municipal and county governments. Severance taxes cannot be projected because the formula requires data in operating cost to determine taxable revenue. Impacts would be large.

The Federal royalty rate of 12.5 percent per ton of coal produced under an assumed weighted average price of $20.00 per ton, would amount to $50,000,000 at the maximum production of 20 million tons per year. The state of Colorado receives 50 percent of Federal royalties, which would be $25,000,000 under the maximum production. Fifty percent of this share, or a maximum of $800,000, should be returned to the county of origin. Thus Rio Blanco County should receive 50 percent of Federal royalty revenues returned to the state of Colorado under this alternative.

Estimated capital benefits and costs are shown in Table 3-30. Definition of terms and analytical methods are given in notes to the table. Most infrastructures, already built to accommodate over 15,000 persons, would need only repair or modernization. School districts should have little difficulty financing their additional needs.

TRANSPORTATION

AFFECTED ENVIRONMENT

Based on the Colorado Department of Highway Study (1980), present traffic volume on Colorado Highway 13 between Meeker and Craig is approximately the same as it was in 1980 (Table 3-31 and Map 3-18).

Year	*Community*	*No Development*	*20 Million Tons*	*15 Million Tons*	*12 Million Tons*
2000	Meeker				
	Bonding Capacity	1,565	1,548	1,380	1,291
	Capital Requirements	0	1,800	1,000	70
	Craig				
	Bonding Capacity[1]	1,315	3,216	2,135	2,030
	Capital Requirements	1,600	1,600	1,200	980
	Meeker School District				
	Bonding Capacity	13,454	13,307	11,860	11,000
	Capital Requirements	0	3,950	2,888	580
	Moffat County School District				
	Bonding Capacity	60,227	58,238	56,724	55,063
	Capital Requirements	2,817	2,817	2,662	1,780

Note: This analysis discusses the impact on capital budgets, usually the most severe impact accompanying energy development.

Two measures are used: bonding capacity and capital requirements. Bonding capacity is a limit established by the State legislature on the dollar value of general obligation bonds a local jurisdiction may have outstanding. It is based on assessed valuation, amounting to approximately 10 percent for communities and 20 percent for school districts. Home rule cities are not subject to this limit but, since voter resistance increases as more bonds are issued, a similar limit may well apply. General obligation bonds outstanding as of 12/31/84 (the latest published data) were subtracted from gross bonding capacity because the tracts are not included and because of the difficulty of projecting the assessed valuation of oil shale properties.

Capital requirements are an estimate of the investment in capital improvements that would be necessitated by population growth. Complete capital budgeting for the jurisdiction was, of course, impossible. Seven items were estimated for communities: water and wastewater systems, fire truck pumping capacity and fire station space, municipal and police office space, and police vehicles and ambulances. Classroom space was estimated for school districts. They include most, though not all, of the most costly types of facilities. Requirements were estimated by local use rates, where available, or population-based standards, with present capacities then subtracted. The resultant estimates are order-of-magnitude only, but they highlight the jurisdictions that can have fiscal problems if these developments occur.

Counties are excluded from this analysis because many of their facility requirements cannot be estimated by a direct ratio to population.

[1] Home rule city - Craig.

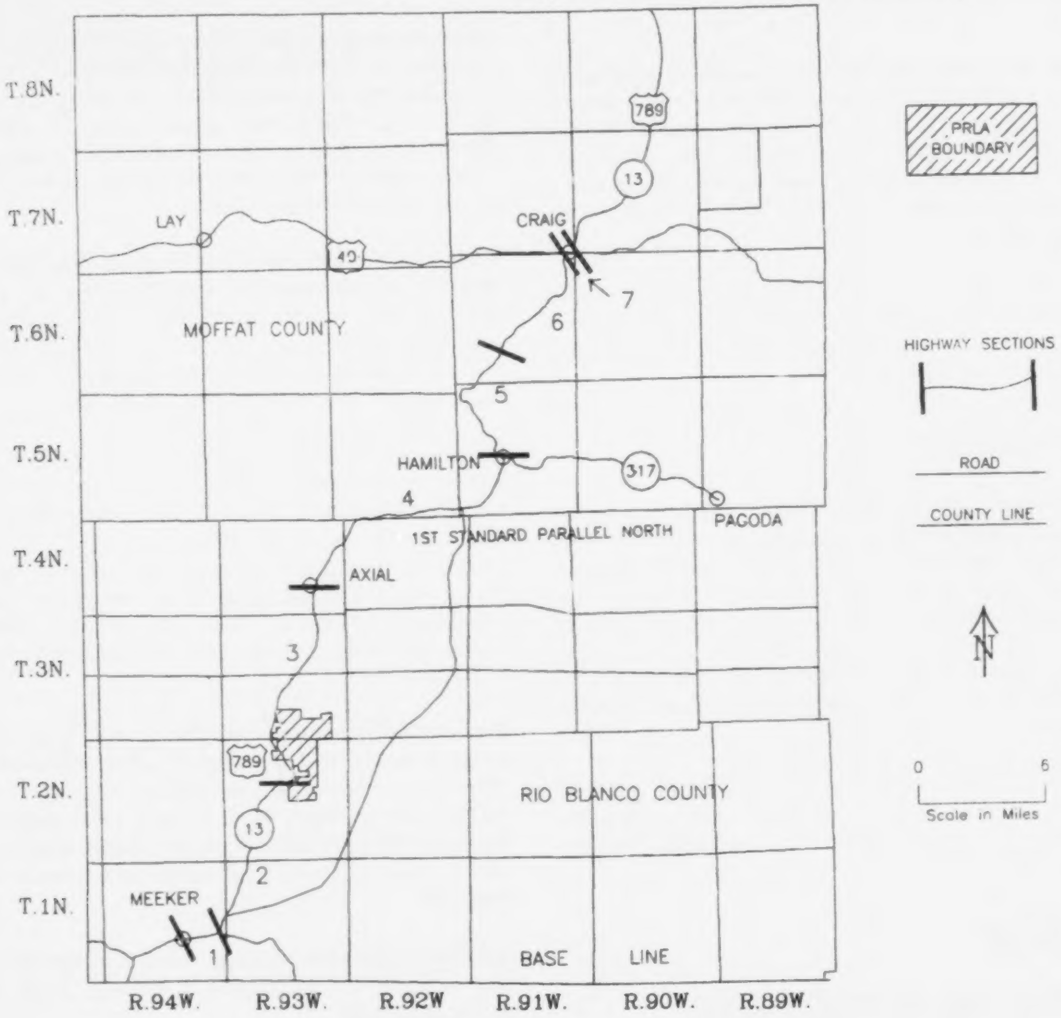
Table 3-30 Cumulative Community Bonding Capacity andCapital Requirements (Dollars in Thousands)

Section	Daily Traffic Volume	Peak Hour	Design Capacity Traffic (per hour)	Percentage of Capacity
1	2,900	348	760*	46
2	1,250	175	760	23
3	1,150	138	790	18
4	1,400	168	790	21
5	1,750	210	790	27
6	2,500	300	790	38
7	3,500	420	790	53

Table 3-31 1980 Traffic on State Highway 13

Highway Section*	Daily Traffic Volume	Peak Hour Traffic	Design Capacity (per hour)	Percentage of Capacity	Percentage Increase
1	3,190	790	760	104	58
2	1,375	600	760	79	56
3	1,265	335	790	44	26
4	1,540	365	790	46	25
5	1,925	410	790	52	25
6	2,750	510	790	65	27
7	3,850	640	790	81	27

Table 3-32 Traffic Projections on State Highway 13 (for 10 MIllion-Ton-Per-Year Production)


T.8N.
T.7N.
T.6N.
T.5N.
T.4N.
T.3N.
T.2N.
T.1N.
789
13
LAY
40
CRAIG
7
6
MOFFAT COUNTY
5
HAMILTON
317
PAGODA
4
1ST STANDARD PARALLEL NORTH
AXIAL
3
789
13
RIO BLANCO COUNTY
2
MEEKER
1
BASE LINE
R.94W.
R.93W.
R.92W
R.91W.
R.90W.
R.89W.
PRLA BOUNDARY
HIGHWAY SECTIONS
ROAD
COUNTY LINE
N
0
6
Scale in Miles

Map 3-18 Transportation and Highway Segment Numbers

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

Under the No Development Alternative, road and rail traffic would not increase. Traffic would remain at the 1980 base level (Table 3-32).

Development Alternatives

Population increases, traffic to and from the mine, and coal hauled by truck would increase traffic on State Highway 13 between Meeker and Craig. Table 3-32 shows projected traffic volumes under all development alternatives.

Peak hour traffic increases due to shift changes might cause traffic congestion at Meeker and Craig. Congestion would cause a drop in the traffic speed by 10 mph. Heavier daily traffic volumes would cause more rapid wear of pavement surface, and highway maintenance needs would increase. Map 3-18 identifies highway segments analyzed.

The additional 7 unit trains (100 cars) per day under the applicant's proposal would have only a minor affect on the rail line. These additions would be well within the capacity of the rail line.

Conclusion

The present highway system could accommodate the estimated traffic for a mine producing up to 5 million tons per year. Since Colorado Department of Highways studies have shown that serious traffic congestion generally occurs as the peak hourly traffic approaches 80 percent of highway capacity, careful scheduling of office and production hours would be necessary at a peak production of 10 million tons per year. No significant impacts are expected.

Traffic accident statistics indicate an increase from 3.60 to 4.05 accidents per million vehicle miles, or a possible increase of four accidents per year under the Development alternatives.

NOISE

AFFECTED ENVIRONMENT

At present, the proposed mine site is open grazing land with little human habitation or intrusion. State Highway 13, on the west edge of the project area, is a medium traffic road with noise levels of 35 decibels or less along the right-of-way boundaries.

ENVIRONMENTAL CONSEQUENCES

No Action/No Development Alternatives

Noise would not increase.

Development Alternatives

Noise levels would increase at the mine site because of heavy equipment use and truck or conveyor noise on the haul route to the loadout facility. There would be a second noise point source at the loadout.

Blasting noise in a pit behind the screening ridge would have only a minor impact on people riding in vehicles on State Highway 13.

Off-site noise level increases would be the result of increased traffic on State Highway 13 and train traffic on the rail spur to the mine loadout.

Mine noise would be held to an undiscernable level (less than a 3 decibel increase) because of the physical location of the project. A high ridge between James Creek and State Highway 13 would block most, if not all, sound from the mining and hauling operations. Distance between the ridge and highway would further reduce noise.

Because of the location, loadout facility noise would also be held to minor levels. The distance between the facility and State Highway 13 would be 700 to 800 feet and the distance to the nearest home would be over 3,000 feet. A noise level of 60 decibels at 50 feet from the loadout chutes would be discerned as 36 decibels on the highway (35 decibels or less now). Studies have shown an increase of less than 3 decibels is not discernable to a normal human ear.

Traffic noise increases, even during peak hour traffic, probably would not be noticeable off the right-of-way. There is one home along State Highway 13 that is close to the right-of-way fence, about 1/2 mile north of the confluence of Good Spring Creek and James Creek. Increased noise may be noticeable and bothersome to these residents.

Railroad train noise might be a factor along the spur, depending on the track's location. However, train traffic would be limited.

Conclusion

Insignificant increases in noise levels would result.

NET ENERGY

Net energy analysis is a computation of the energy requirements to produce coal. The energy of the coal produced divided by the energy required to produce it yields a net energy ratio. Units are calculated in British thermal units (Btus) of energy and pounds (lbs) of coal.

For this study, a conservative estimate of 10,000 Btu/lb was used for the coal energy. Each pound of coal would produce an estimated 10,000 Btus. Factors considered in production included energy requirements for mining operation, product transportation, employee transportation, and infrastructure support. Although the numbers may vary at different levels of production, the base ratio is 122:1 or 122 Btu of energy produced for each Btu of energy expended.

CHAPTER FOUR

CONSULTATION AND COORDINATION APPENDICES

CHAPTER 4—CONSULTATION AND COORDINATION

CONSULTING AGENCIES

LOCAL GOVERNMENTS

Areas of concern have been disucssed with the Rio Blanco County Commissioners and the Moffat County Planning Department during preparation of the EIS.

STATE AGENCIES

BLM has also been working closely with the Coloardo Division of Wildlife (CDOW) to mitigate impacts to wildlife. The position of the CDOW is presented in Figure 4-1.

As required by 36 CFR 60.4 and 36 CFR 800, BLM has consulted with the Colorado State Historical Society concerning the proposed PRLA.

The Colorado Historical Society's letter of April 3, 1985, requested the following stipulations:

1. A Class III cultural resource inventory will be conducted on all areas that will be disturbed. This excludes those areas previously inventoried at this level.

2. Determinations of significance and effect will be conducted per 36 CFR 60.4 and 36 CFR 800.

3. A written report will be prepared on the results of the above two measures and will include a treatment plan for the eligible cultural resources.

BLM has involved the Colorado Mined Land Reclamation Division on the proposed mine development scenario.

FEDERAL AGENCIES

BLM consulted with the following Federal agencies:

1. U.S. Fish and Wildlife Service (USFWS) on threatened and endangered species and raptors. Based on the results of informal consultation BLM specialists do not anticipate any impacts to these species based on information now available. It is the policy of the USFWS, as relayed to BLM, that any unmitigated depletion in flow in the Upper Colorado River system may jeopardize threatened and endangered fish species. This includes depletions of less than one cubic foot per second. Because of this policy, a stipulation requiring compensation for loss of flow has been added to BLM's preferred alternative. Formal consultation has been initiated. (See Figure 4-2).

The USFWS became a cooperating agency after publication of the draft EIS. As a result of concerns raised by the FWS on the draft EIS, efforts have been made to clarify and resolve concerns.

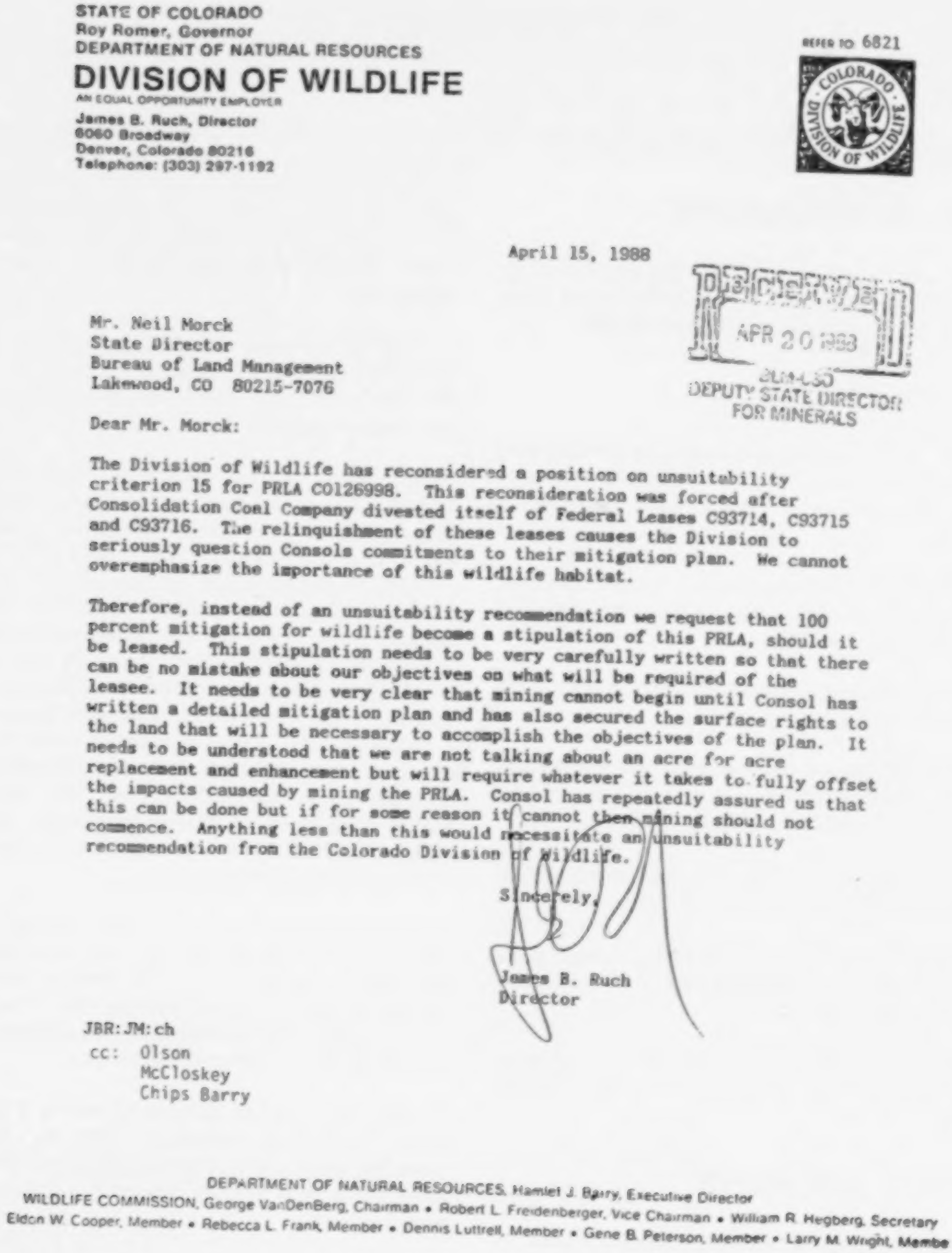
Issues regarding compliance with the National Environmental Policy Act (NEPA) and the Threatened and Endangered Species Act have been resolved. Chapters 1 and 2 have been revised to more clearly reflect the difference between leasing and permitting, and the actions which are authorized by each type of decision. The BLM recognizes that aspen and riparian/wetland reclamation would rely on practices not commonly used in mine reclamation. While many practices commonly used in forestry and horticulture could reasonably be expected to be successful in reclamation of mined lands, the use of such practices to reclaim lands disturbed by mining would be experimental. The concern of the FWS has increased BLM's commitment to include performance standards and the requirement for studies prior to surface disturbance, as lease stipulations.

While cummulative impacts to wildlife from all foreseeable development have been addressed in this EIS, BLM recognizes the concern of the FWS that the future is uncertain and predictions may become valid. The authors of this analysis claim no special abilities, insights, or "crystal ball" for the prediction of the future.

It is the understanding of the BLM that the FWS would prefer the no action, exchange, or withdrawal/just compensation alternative be implemented rather than an alternative which could ultimately result in development of the area.

2. Office of Surface Mining on determination of alluvial valley floors.

3. The Corps of Engineers on possible riparian/wetland impacts.



STATE OF COLORADO
Roy Romer, Governor
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WILDLIFE

AN EQUAL OPPORTUNITY EMPLOYER

James B. Ruch, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192

REFER TO 6821

April 15, 1988

RECEIVED
APR 20 1988
BLM-CSO
DEPUTY STATE DIRECTOR
FOR MINERALS

Mr. Neil Morck
State Director
Bureau of Land Management
Lakewood, CO 80215-7076

Dear Mr. Morck:

The Division of Wildlife has reconsidered a position on unsuitability criterion 15 for PRLA C0126998. This reconsideration was forced after Consolidation Coal Company divested itself of Federal Leases C93714, C93715 and C93716. The relinquishment of these leases causes the Division to seriously question Consols commitments to their mitigation plan. We cannot overemphasize the importance of this wildlife habitat.

Therefore, instead of an unsuitability recommendation we request that 100 percent mitigation for wildlife become a stipulation of this PRLA, should it be leased. This stipulation needs to be very carefully written so that there can be no mistake about our objectives on what will be required of the leasee. It needs to be very clear that mining cannot begin until Consol has written a detailed mitigation plan and has also secured the surface rights to the land that will be necessary to accomplish the objectives of the plan. It needs to be understood that we are not talking about an acre for acre replacement and enhancement but will require whatever it takes to fully offset the impacts caused by mining the PRLA. Consol has repeatedly assured us that this can be done but if for some reason it cannot then mining should not commence. Anything less than this would necessitate an unsuitability recommendation from the Colorado Division of Wildlife.

Sincerely,

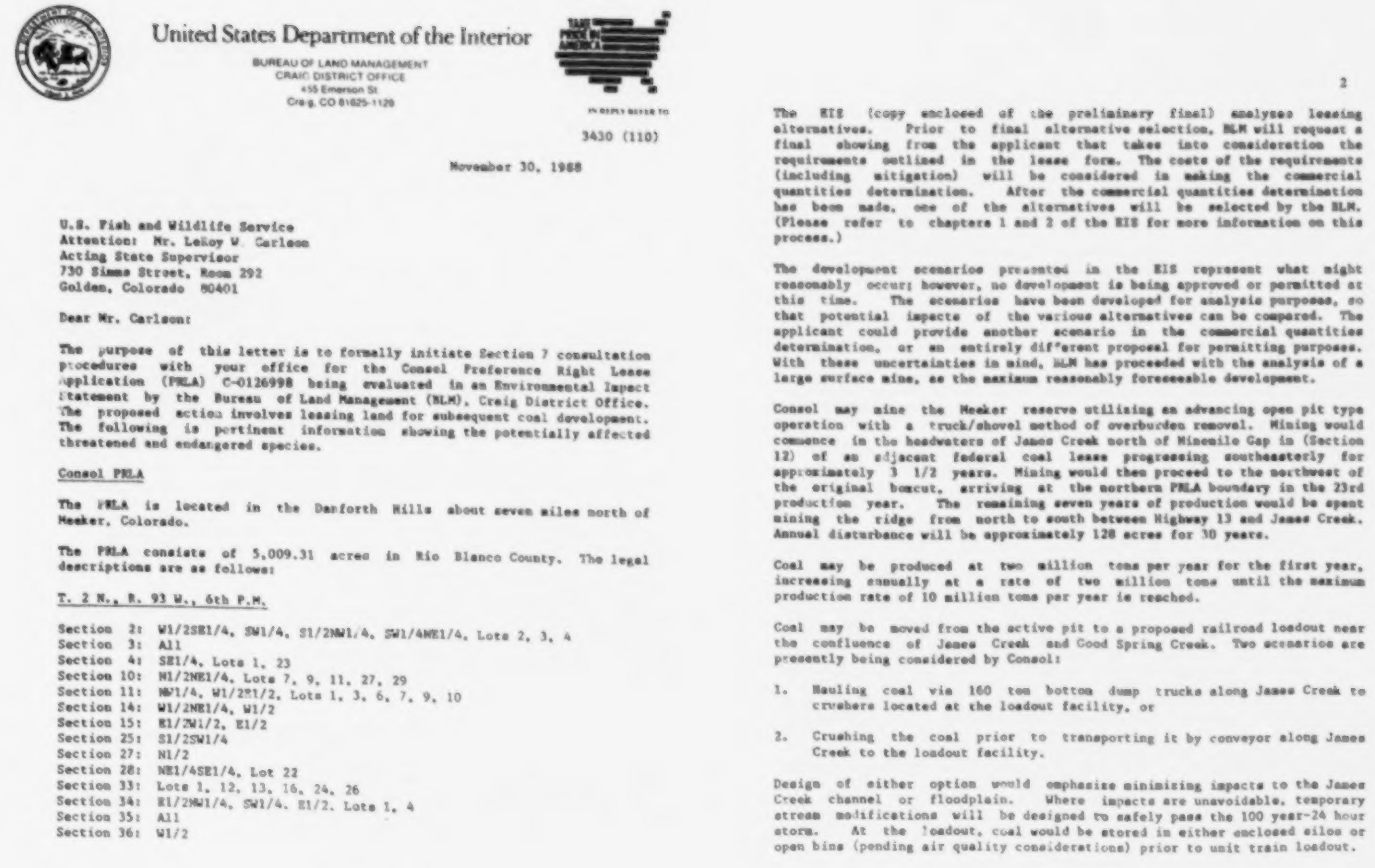
James B. Ruch
Director

JBR:JM:ch

cc: Olson
McCloskey
Chips Barry

DEPARTMENT OF NATURAL RESOURCES, Hamlet J. Barry, Executive Director
WILDLIFE COMMISSION, George VanDenBerg, Chairman • Robert L. Freidenberger, Vice Chairman • William R. Hegberg, Secretary
Eldon W. Cooper, Member • Rebecca L. Frank, Member • Dennis Luttrell, Member • Gene B. Peterson, Member • Larry M. Wright, Membe

Figure 4-1 Colorado Division of Wildlife Position Letter



United States Department of the Interior
BUREAU OF LAND MANAGEMENT
CRAIG DISTRICT OFFICE
455 Emerson St.
Craig, CO 81625-1129

IN REPLY REFER TO
3430 (110)

November 30, 1988

U.S. Fish and Wildlife Service
Attention: Mr. LeRoy W. Carlson
Acting State Supervisor
730 Simms Street, Room 292
Golden, Colorado 80401

Dear Mr. Carlson:

The purpose of this letter is to formally initiate Section 7 consultation procedures with your office for the Consol Preference Right Lease Application (PRLA) C-0126998 being evaluated in an Environmental Impact Statement by the Bureau of Land Management (BLM), Craig District Office. The proposed action involves leasing land for subsequent coal development. The following is pertinent information showing the potentially affected threatened and endangered species.

Consol PRLA

The PRLA is located in the Danforth Hills about seven miles north of Meeker, Colorado.

The PRLA consists of 5,009.31 acres in Rio Blanco County. The legal descriptions are as follows:

T. 2 N., R. 93 W., 6th P.M.

Section 2: W1/2SE1/4, SW1/4, S1/2NW1/4, SW1/4NE1/4, Lots 2, 3, 4
Section 3: All
Section 4: SE1/4, Lots 1, 23
Section 10: N1/2NE1/4, Lots 7, 9, 11, 27, 29
Section 11: NW1/4, W1/2E1/2, Lots 1, 3, 6, 7, 9, 10
Section 14: W1/2NE1/4, W1/2
Section 15: E1/2W1/2, E1/2
Section 25: S1/2SW1/4
Section 27: N1/2
Section 28: NE1/4SE1/4, Lot 22
Section 33: Lots 1, 12, 13, 16, 24, 26
Section 34: E1/2NW1/4, SW1/4, E1/2, Lots 1, 4
Section 35: All
Section 36: W1/2

2

The EIS (copy enclosed of the preliminary final) analyzes leasing alternatives. Prior to final alternative selection, BLM will request a final showing from the applicant that takes into consideration the requirements outlined in the lease form. The costs of the requirements (including mitigation) will be considered in making the commercial quantities determination. After the commercial quantities determination has been made, one of the alternatives will be selected by the BLM. (Please refer to chapters 1 and 2 of the EIS for more information on this process.)

The development scenarios presented in the EIS represent what might reasonably occur; however, no development is being approved or permitted at this time. The scenarios have been developed for analysis purposes, so that potential impacts of the various alternatives can be compared. The applicant could provide another scenario in the commercial quantities determination, or an entirely different proposal for permitting purposes. With these uncertainties in mind, BLM has proceeded with the analysis of a large surface mine, as the maximum reasonably foreseeable development.

Consol may mine the Meeker reserve utilizing an advancing open pit type operation with a truck/shovel method of overburden removal. Mining would commence in the headwaters of James Creek north of Ninemile Gap in (Section 12) of an adjacent federal coal lease progressing southeasterly for approximately 3 1/2 years. Mining would then proceed to the northwest of the original boxcut, arriving at the northern PRLA boundary in the 23rd production year. The remaining seven years of production would be spent mining the ridge from north to south between Highway 13 and James Creek. Annual disturbance will be approximately 128 acres for 30 years.

Coal may be produced at two million tons per year for the first year, increasing annually at a rate of two million tons until the maximum production rate of 10 million tons per year is reached.

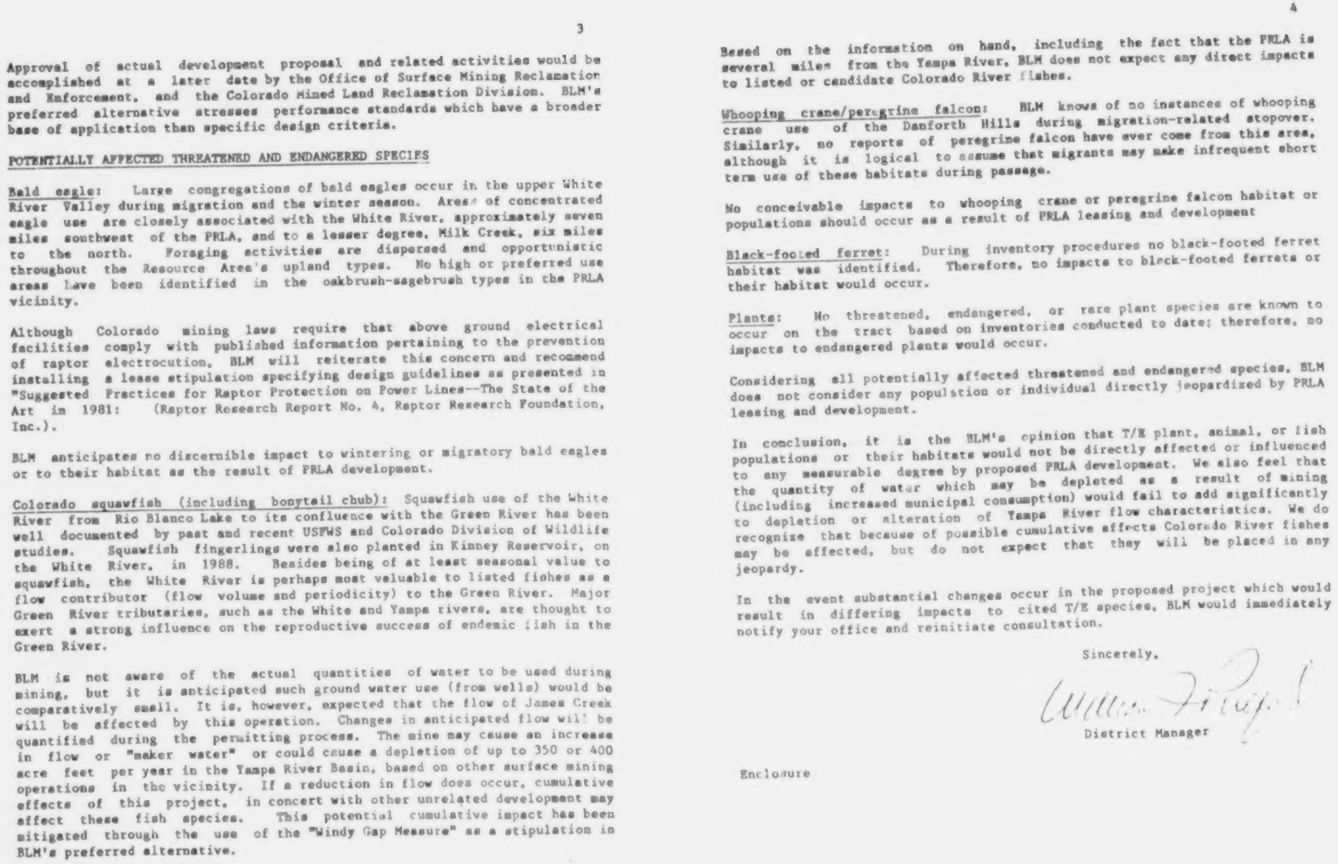
Coal may be moved from the active pit to a proposed railroad loadout near the confluence of James Creek and Good Spring Creek. Two scenarios are presently being considered by Consol:

1. Hauling coal via 160 ton bottom dump trucks along James Creek to crushers located at the loadout facility, or

2. Crushing the coal prior to transporting it by conveyor along James Creek to the loadout facility.

Design of either option would emphasize minimizing impacts to the James Creek channel or floodplain. Where impacts are unavoidable, temporary stream modifications will be designed to safely pass the 100 year-24 hour storm. At the loadout, coal would be stored in either enclosed silos or open bins (pending air quality considerations) prior to unit train loadout.

Figure 4-2 U.S.F.W.S. Consultation Letters



Approval of actual development proposal and related activities would be accomplished at a later date by the Office of Surface Mining Reclamation and Enforcement, and the Colorado Mined Land Reclamation Division. BLM's preferred alternative stresses performance standards which have a broader base of application than specific design criteria.

POTENTIALLY AFFECTED THREATENED AND ENDANGERED SPECIES

Bald eagle: Large congregations of bald eagles occur in the upper White River Valley during migration and the winter season. Areas of concentrated eagle use are closely associated with the White River, approximately seven miles southwest of the PRLA, and to a lesser degree, Milk Creek, six miles to the north. Foraging activities are dispersed and opportunistic throughout the Resource Area's upland types. No high or preferred use areas have been identified in the oakbrush-sagebrush types in the PRLA vicinity.

Although Colorado mining laws require that above ground electrical facilities comply with published information pertaining to the prevention of raptor electrocution, BLM will reiterate this concern and recommend installing a lease stipulation specifying design guidelines as presented in "Suggested Practices for Raptor Protection on Power Lines--The State of the Art in 1981: (Raptor Research Report No. 4, Raptor Research Foundation, Inc.).

BLM anticipates no discernible impact to wintering or migratory bald eagles or to their habitat as the result of PRLA development.

Colorado squawfish (including bonytail chub): Squawfish use of the White River from Rio Blanco Lake to its confluence with the Green River has been well documented by past and recent USFWS and Colorado Division of Wildlife studies. Squawfish fingerlings were also planted in Kinney Reservoir, on the White River, in 1988. Besides being of at least seasonal value to squawfish, the White River is perhaps most valuable to listed fishes as a flow contributor (flow volume and periodicity) to the Green River. Major Green River tributaries, such as the White and Yampa rivers, are thought to exert a strong influence on the reproductive success of endemic fish in the Green River.

BLM is not aware of the actual quantities of water to be used during mining, but it is anticipated such ground water use (from wells) would be comparatively small. It is, however, expected that the flow of James Creek will be affected by this operation. Changes in anticipated flow will be quantified during the permitting process. The mine may cause an increase in flow or "maker water" or could cause a depletion of up to 350 or 400 acre feet per year in the Yampa River Basin, based on other surface mining operations in the vicinity. If a reduction in flow does occur, cumulative effects of this project, in concert with other unrelated development may affect these fish species. This potential cumulative impact has been mitigated through the use of the "Windy Gap Measure" as a stipulation in BLM's preferred alternative.

Based on the information on hand, including the fact that the PRLA is several miles from the Yampa River, BLM does not expect any direct impacts to listed or candidate Colorado River fishes.

Whooping crane/peregrine falcon: BLM knows of no instances of whooping crane use of the Danforth Hills during migration-related stopover. Similarly, no reports of peregrine falcon have ever come from this area, although it is logical to assume that migrants may make infrequent short term use of these habitats during passage.

No conceivable impacts to whooping crane or peregrine falcon habitat or populations should occur as a result of PRLA leasing and development

Black-footed ferret: During inventory procedures no black-footed ferret habitat was identified. Therefore, no impacts to black-footed ferrets or their habitat would occur.

Plants: No threatened, endangered, or rare plant species are known to occur on the tract based on inventories conducted to date; therefore, no impacts to endangered plants would occur.

Considering all potentially affected threatened and endangered species, BLM does not consider any populstion or individual directly jeopardized by PRLA leasing and development.

In conclusion, it is the BLM's opinion that T/E plant, animal, or fish populations or their habitats would not be directly affected or influenced to any measurable degree by proposed PRLA development. We also feel that the quantity of water which may be depleted as a result of mining (including increased municipal consumption) would fail to add significantly to depletion or alteration of Yampa River flow characteristics. We do recognize that because of possible cumulative affects Colorado River fishes may be affected, but do not expect that they will be placed in any jeopardy.

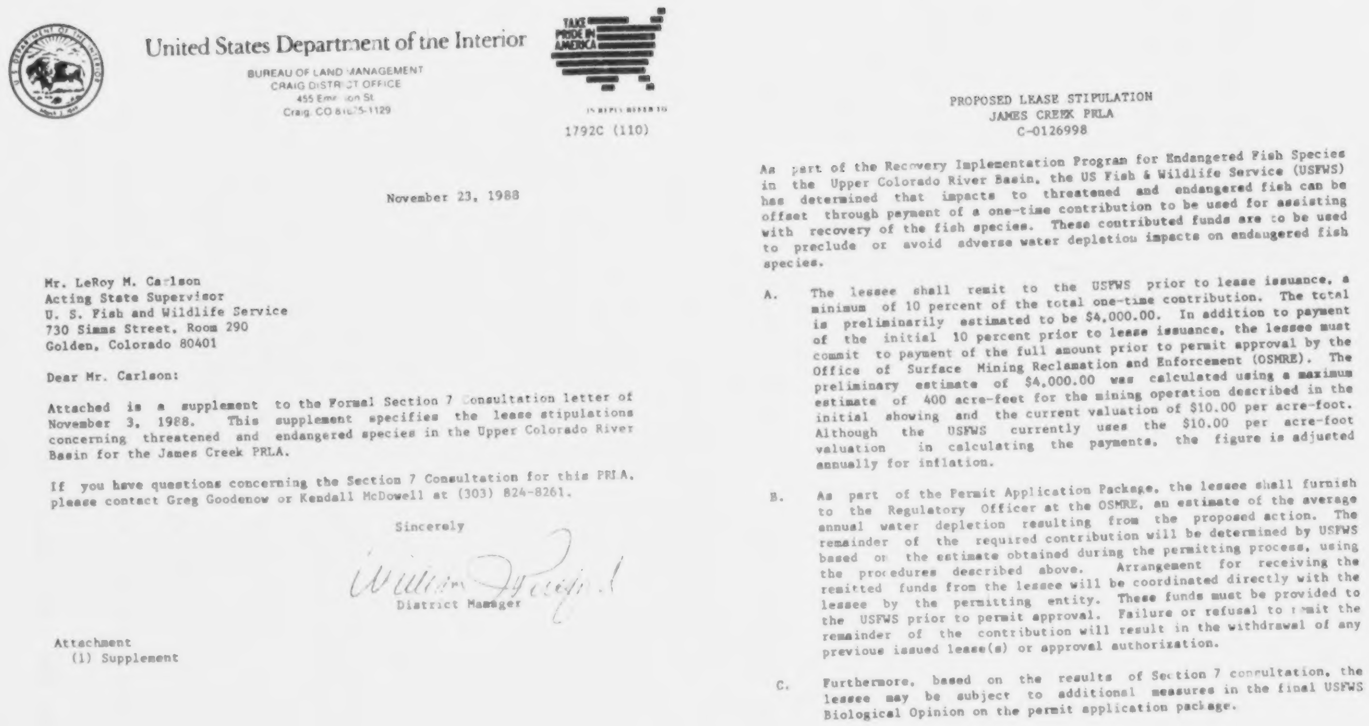
In the event substantial changes occur in the proposed project which would result in differing impacts to cited T/E species, BLM would immediately notify your office and reinitiate consultation.

Sincerely,

District Manager

Enclosure

Figure 4-2 (Cont') U.S.F.W.S. Consultation Letters



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
CRAIG DISTRICT OFFICE
455 Emerson St
Craig, CO 81625-1129

TAKE PRIDE IN AMERICA

IN REPLY REFER TO
1792C (110)

November 23, 1988

Mr. LeRoy M. Carlson
Acting State Supervisor
U. S. Fish and Wildlife Service
730 Simms Street, Room 290
Golden, Colorado 80401

Dear Mr. Carlson:

Attached is a supplement to the Formal Section 7 Consultation letter of November 3, 1988. This supplement specifies the lease stipulations concerning threatened and endangered species in the Upper Colorado River Basin for the James Creek PRLA.

If you have questions concerning the Section 7 Consultation for this PRLA, please contact Greg Goodenow or Kendall McDowell at (303) 824-8261.

Sincerely

William

District Manager

Attachment
(1) Supplement

PROPOSED LEASE STIPULATION
JAMES CREEK PRLA
C-0126998

As part of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, the US Fish & Wildlife Service (USFWS) has determined that impacts to threatened and endangered fish can be offset through payment of a one-time contribution to be used for assisting with recovery of the fish species. These contributed funds are to be used to preclude or avoid adverse water depletion impacts on endangered fish species.

A. The lessee shall remit to the USFWS prior to lease issuance, a minimum of 10 percent of the total one-time contribution. The total is preliminarily estimated to be $4,000.00. In addition to payment of the initial 10 percent prior to lease issuance, the lessee must commit to payment of the full amount prior to permit approval by the Office of Surface Mining Reclamation and Enforcement (OSMRE). The preliminary estimate of $4,000.00 was calculated using a maximum estimate of 400 acre-feet for the mining operation described in the initial showing and the current valuation of $10.00 per acre-foot. Although the USFWS currently uses the $10.00 per acre-foot valuation in calculating the payments, the figure is adjusted annually for inflation.

B. As part of the Permit Application Package, the lessee shall furnish to the Regulatory Officer at the OSMRE, an estimate of the average annual water depletion resulting from the proposed action. The remainder of the required contribution will be determined by USFWS based on the estimate obtained during the permitting process, using the procedures described above. Arrangement for receiving the remitted funds from the lessee will be coordinated directly with the lessee by the permitting entity. These funds must be provided to the USFWS prior to permit approval. Failure or refusal to remit the remainder of the contribution will result in the withdrawal of any previous issued lease(s) or approval authorization.

C. Furthermore, based on the results of Section 7 consultation, the lessee may be subject to additional measures in the final USFWS Biological Opinion on the permit application package.

Figure 4-2 (Cont') U.S.F.W.S. Consultation Letters

LIST OF PREPARERS

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B.A., 1964, Social Science, University of Northern Colorado

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M.S., 1969, Agricultural Chemistry and Soils, University of Arizona
B.A., 1966, Chemistry, California Western University

Experience: 4 years as soil scientist, BLM, Colorado; 6 years as soil scientist BLM, Oregon

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B.S., 1965, Wildlife Management, Humboldt State College

Experience: 11 1/2 years as district wildlife biologist, BLM, Colorado; 6 1/2 years as natural resource specialist, BLM, Montana; 3 1/2 years as natural resource specialist, BLM, Wyoming; 1/2 year as soil conservationist, SCS, California

MICHAEL PIONTKOWSKI---Cultural Resources

B.S., 1973, Anthropology, Oregon State University

Experience: 7 years as archaeologist, BLM, Colorado; 1 year as project manager, private industry, Louisiana/Missouri; 2 1/2 years as archaeologist, Missouri; 2 years as archaeologist, New Mexico/Oregon

MARY PRESSLEY---Writer/Editor

B.A., 1977, International Relations, Brigham Young University

Experience: 3 1/2 years as writer/editor, BLM, Colorado; 3 years as public affairs specialist, BLM, Colorado; 2 years as public affairs specialist, US Forest Service, Idaho

C. E. TIMMONS---Technical Coordinator

B.S., 1961, Geology, Lamar University

Experience: 2 years as geologist, BLM, Colorado; 1 year as geologist, MMS, Colorado; 3 years as geologist, USGS-Conservation Division, Colorado; 1 1/2 years as geologist, BLM, Colorado; self employed as consulting geologist; geologist/geophysicist for various Federal agencies

APPENDIX A

UNSUITABILITY ANALYSIS

APPENDIX A

UNSUITABILITY ANALYSIS

Regulations for coal management given in 43 CFR 3461 require the BLM to apply 20 unsuitability criteria to lands considered for lease for coal mining operations. If any of the criteria are found applicable, affected portions of the lease are declared unsuitable for all or certain methods of surface coal mining activity. If impacts to land values addressed in each criterion could be avoided or satisfactorily ameliorated through lease stipulation, the unsuitability designation would be rescinded. Exceptions described in each criterion's definition found in 43 CFR 3460, if applicable, preempt unsuitability analysis or designation. A copy of 43 CFR 3460 is found at the end of Appendix A. The criteria were applied to the PRLA and although none of them would absolutely prevent mining, five of them would require that mitigative measures be applied before the tract could be found suitable.

A brief summary of the five applicable criteria follows:

1. Two public roads bisect the PRLA; all lands within 100 feet of the right-of-way are unsuitable under this criteria, unless an exception applies.

2. There is a series of rock alignments that require test excavation in order to determine their eligibility to the National Register. Suitability under this criterion can only be determined for those sites on or eligible to be on the National Register of Historic Places. A determination has not been made and can only be applied when all cultural resources are known.

3. The PRLA is composed of an important aggregation of habitats considered to be important in maintaining present characteristics of the main White River elk herd.

Criterion #15 (Fish and Wildlife Habitat) does not preclude mining; however, mitigation must be applied.

4. If loadout facilities and/or transportation facilities were located within the 100-year floodplain boundary, the operator would be required, and in fact, Consol has proposed, to install appropriate flood control measures for the control of runoff and sediment.

5. Criterion #19 (Alluvial Valley Floors) would require mitigation designed to protect the water supply systems to the significant agricultural land in James Creek and Good Spring Creek at the time of the mine plan. Determination of significance will be performed by OSMRE at the mine permit stage.

A detailed description of the application of each of the 20 unsuitability criteria follows:

Criterion 1: Federal Land Systems

None of the Federal land systems were found on the application area. Therefore, the area was not considered to be unsuitable.

Criterion 2: Rights-of-Way and Easements

Field examination and consultation with district and area staff indicates that no rights-of-way, easements, surface leases, or agricultural crop production (on federally owned surface) occur on the area. The criterion is, thus, not applicable.

Criterion 3: Buffer Zones

State Highway 13 and Rio Blanco County Road 30 bisect the PRLA boundary. All lands within 100 feet of the outside line of the right-of-way are considered unsuitable. The residence is not occupied and therefore not unsuitable.

Criterion 4: Wilderness Study Areas

No lands have been designated as wilderness study areas within or adjacent to the application area.

Criterion 5: Scenic Areas

No Class I scenic areas have been identified within or adjacent to the application area.

Criterion 6: Lands Used for Scientific Studies

Camp, Dresser, and McKee are currently conducting elk studies in the area for Consol, in relation to the Consol PRLA proposal. Development should not be constrained under this criterion.

Criterion 7: Historic Lands and Sites

Approximately 866 acres have been inventoried at the Class III level and 11 cultural resources have been recorded on the tract. Nine of the sites have been evaluated for inclusion on the National Register of Historic Places. Three sites have been recommeded as eligible, based on field evaluation.

Criterion 8: Natural Areas

No lands have been designated or proposed for designation as Natural Areas or as National Natural Landmarks within the area of study.

Criterion 9: Federally Listed Endangered Species

There are no areas of critical habitat identified for federally listed threatened and endangered (T/E) species in the immediate PRLA area.

The endangered bald eagle occasionally forages over these upland areas from winter roosting sites along the White River, 5 miles south of the tract. BLM, Fish and Wildlife Service, and the Colorado Division of Wildlife have consulted and agreed that bald eagle, or their habitat, would not be adversely affected by lease development.

Development on the PRLA could indirectly affect threatened and endangered fish populations inhabiting the distant Yampa (Colorado River squawfish, humpback chub) and White (Colorado River squawfish) rivers, because of their tributary relationships with local PRLA drainages (i.e., Curtis and Good Spring creeks, which eventually complement the White and Yampa rivers).

The predominant concern in the protection of these endemic fishes, especially spawning requirements, is the continued maintenance of contributory flows (quantity of water) to the White and Yampa rivers and the preservation of these rivers' flow periodicity (high/low water schedules). After consultation with the Fish and Wildlife Service in 1982, it was decided that unsuitability designation was unwarranted for this criterion.

No threatened or endangered plant species are known to occur on the site.

Criterion 10: State Listed Threatened or Endangered Species

The state threatened and endangered species list conforms to the Federal listing with the exception of the razorback sucker, which inhabits the Yampa River.

The previous narrative pertaining to federally listed endangered species (Criterion 9) is equivalent to this criterion.

After consultation with the Colorado Division of Wildlife, it was determined that no state listed animal species, or their habitats, would be adversely affected by lease development.

No state listed threatened or endangered plant species are known to occur on the PRLA.

Criterion 11: Bald and Golden Eagle Nests

No eagle nests are within or adjacent to the application boundary.

Criterion 12: Bald and Golden Eagle Roost and Concentration Areas

No eagle roosts or concentration areas are within or adjacent to the application boundary.

Criterion 13: Falcon Cliff Nesting Sites

No falcon cliff nesting sites occur on the PRLA.

Criterion 14: Migratory Birds

No high priority habitat areas for migratory bird species are known to occur.

Criterion 15: State Resident Fish and Wildlife Habitat

Consol's commitment to off-site enhancement and avoiding the avoidance areas diagramed in figure 3-1 (CDM's Elk Mitigation Feasibility Assessment and Mitigation Plan (located in Appendix D) would be sufficient mitigation to remove the wildlife unsuitability criteria from the proposed mine area as illustrated in figure 2-5 of this EIS.

Criterion 16: Floodplains

BLM regulations require identification of floodplains (based on a 24-hour precipitation event with a 100-year recurrence interval) on which mining could not be undertaken without substantial threat of loss of life or property (43 CFR 3461.1, 1984).

If loadout facilities and/or transporation facilities were located within the 100-year floodplain boundary, the operator would be required, and in fact Consol has proposed, to install appropriate flood control measures for the control of runoff and sediment. As proposed, no actual coal excavation activities would take place within the 100-year floodplain. Care should be excercised in designing flood control measures to ensure protection of Highway 13/789 and the ranch property located approximately 3/4 mile downsteam from James Creek and the Good Spring Creek confluence.

Criterion 17: Municipal Watersheds

No municipal watersheds have been identified within the potential coal lease area.

Criterion 18: National Resource Waters

To date, no water courses in the area have been officially designated as National Resource Waters in completed water quality management plans.

Because the areas under review have not officially been designated, they were considered suitable.

Criterion 19: Alluvial Valley Floors (AVFs)

BLM and CMLRD regulations require identification of alluvial valley floors (AVFs) that may be affected by mining based on guidelines published by OSM and CMLRD (43 CFR 3461.1 (1984), OSM (1983), CMLRD (1980). This will be done through consultation with the appropriate agency in the state of Colorado.

Preliminary AVF classifications are recommended for the specially managed subirrigated lands in sections 15 and 22 of T. 3 N., R. 93 W., and section 9, T. 2 N., R. 93 W., all of which are located outside of the study area. The land in section 9, T. 2 N., R. 93 W., will not be impacted from the proposed mine operation. The AVFs in sections 15 and 22 of T. 3 N., R. 93 W., may be impacted from reduced flows and elevated levels of total dissolved solids. Actual determinations will be made by OSMRE during the mine permitting process when more detailed site-specific information is available. At this time, no AVFs are known to occur within the PRLA boundaries.

Criterion 20: State Proposed Criteria

To date, the state has furnished no information, but has expressed interest in reviewing coal activity on a site-specific basis in the future. Therefore, this criterion was not applied to the project area.

43 CFR

The specific regulations used to guide the unsuitability determination for the James Creek PRLA EIS follow.

Criteria for assessing lands unsuitable for all or certain stipulated methods of coal mining.

(a)(1) *Criterion Number 1.* All Federal lands included in the following land systems or categories shall be considered unsuitable: National Park System, National Wildlife Refuge System, National System of Trails, National Wilderness Preservation System, National Wild and Scenic Rivers System, National Recreation Areas, lands acquired with money derived from the Land and Water Conservation Fund, National Forests, and Federal lands in incorporated cities, towns, and villages.

(2) *Exceptions.* (i) A lease may be issued within the boundaries of any National Forest if the Secretary finds no significant recreational, timber, economic or other values which may be incompatible with the lease; and (A) surface operations and impacts are incident to an underground coal mine, or (B) where the Secretary of Agriculture determines, with respect to lands which do not have significant forest cover within those National Forests west of the 100th Meridian, that surface mining may be in compliance with Multiple-Use Sustained-Yield Act of 1960, the Federal Coal Leasing Amendments Act of 1976 and the Surface Mining Control and Reclamation Act of 1977.

(ii) A lease may be issued within the Custer National Forest with the consent of the Department of Agriculture as long as no surface coal mining operations are permitted.

(3) *Exemptions.* The application of this criterion to lands within the listed land systems and categories is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977. The application of the portion of this criterion applying to land proposed for inclusion in the listed systems does not apply to lands: To which substantial legal and financial commitments were made prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(b)(1) *Criterion Number 2.* Federal lands that are within rights-of-way or easements or within surface leases for residential, commercial, industrial, or other public purposes, on federally owned surface shall be considered unsuitable.

(2) *Exceptions.* A lease may be issued, and mining operations approved, in such areas if the surface management agency determines that:

(i) All or certain types of coal development (e.g., underground mining) will not interfere with the purpose of the right-of-way or easement; or

(ii) The right-of-way or easement was granted for mining purposes; or

(iii) The right-of-way or easement was issued for a purpose for which it is not being used; or

(iv) The parties involved in the right-of-way or easement agree, in writing, to leasing; or

(v) It is impractical to exclude such areas due to the location of coal and method of mining and such areas or uses can be protected through appropriate stipulations.

(3) *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(c)(1) *Criterion Number 3.* Federal lands affected by section 522(e) (4) and (5) of the Surface Mining Control and Reclamation Act of 1977 shall be considered unsuitable. This includes lands within 100 feet of the outside line of the right-of-way of a public road or within 100 feet of a cemetery, or within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling.

(2) *Exceptions.* A lease may be issued for lands:

(i) Used as mine access roads or haulage roads that join the right-of-way for a public road;

(ii) For which the Office of Surface Mining Reclamation and Enforcement has issued a permit to have public roads relocated;

(iii) If, after public notice and opportunity for public hearing in the locality, a written finding is made by the authorized officer that the interests of the public and the landowners affected by mining within 100 feet of a public road will be protected.

(iv) For which owners of occupied dwellings have given written permission to mine within 300 feet of their buildings.

(3) *Exemptions.* The application of this criterion is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977.

(d)(1) *Criterion Number 4.* Federal lands designated as wilderness study areas shall be considered unsuitable while under review by the Administration and the Congress for possible wilderness designation. For any Federal land which is to be leased or mined prior to completion of the wilderness inventory by the surface management agency, the environmental assessment or impact statement on the lease sale or mine plan shall consider whether the land possesses the characteristics of wilderness study area. If the finding is affirmative, the land shall be considered unsuitable, unless issuance of noncompetitive coal leases and mining on leases is authorized under the Wilderness Act and the Federal Land Policy and Management Act of 1976.

(2) *Exemption.* The application of this criterion to lands for which the Bureau of Land Management is the surface management agency and lands in designated wilderness areas in National Forests is subject to valid existing rights.

(e)(1) *Criterion Number 5.* Scenic Federal lands designated by visual resource management analysis as Class I (an area of outstanding scenic quality or high visual sensitivity) but not currently on the National Register of Natural Landmarks shall be considered unsuitable. A lease may be issued if the surface management agency determines that surface coal mining operations will not significantly diminish or adversely affect the scenic quality of the designated area.

(2) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(f)(1) *Criterion Number 6.* Federal lands under permit by the surface management agency, and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments shall be considered unsuitable for the duration of the study, demonstration or experiment, except where mining could be conducted in such a way as to enhance or not jeopardize the purposes of the study, as determined by the surface management agency, or where the principal scientific user or agency gives written concurrence to all or certain methods of mining.

(2) *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(g)(1) *Criterion Number 7.* All publicly owned places on Federal lands which are included in the National Register of Historic Places shall be considered unsuitable. This shall include any areas that the surface management agency determines, after consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, are necessary to protect the inherent values of the property that made it eligible for listing in the National Register.

(2) *Exceptions.* All or certain stipulated methods of coal mining may be allowed if, after consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Officer, they are approved by the surface management agency, and, where appropriate, the State or local agency with jurisdiction over the historic site.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(h)(1) *Criterion Number 8.* Federal lands designated as natural areas or as National Natural Landmarks shall be considered unsuitable.

(2) *Exceptions.* A lease may be issued and mining operation approved in an area or site if the surface management agency determines that:

(i) With the concurrence of the state, the area or site is of regional or local significance only;

(ii) The use of appropriate stipulated mining technology will result in no significant adverse impact to the area or site; or

(iii) The mining of the coal resource under appropriate stipulations will enhance information recovery (e.g., paleontological sites).

(3) *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which includes operations on which a permit has been issued.

(i)(1) *Criterion Number 9.* Federally designated critical habitat for threatened or endangered plant and animal species, and habitat for Federal threatened or endangered species which is determined by the Fish and Wildlife Service and the surface management agency to be of essential value and where the presence of threatened or endangered species has been scientifically documented, shall be considered unsuitable.

(2) *Exception.* A lease may be issued and mining operations approved if, after consultation with the Fish and Wildlife Service, the Service determines that the propsoed activity is not likely to jeopardize the continued existence of the listed species and/or its critical habitat.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(j)(1) *Criterion Number 10.* Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as endangered or threatened shall be considered unsuitable.

(2) *Exception.* A lease may be issued and mining operations approved if, after consultation with the state, the surface management agency determines that the species will not be adversely affected by all or certain stipulated methods of coal mining.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(k)(1) *Criterion Number 11.* A bald or golden eagle nest or site on Federal lands that is determined to be active and an appropriate buffer zone of land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

(2) *Exceptions.* A lease may be issued if:

(i) It can be conditioned in such a way, either in manner or period of operation, that eagles will not be disturbed during breeding season; or

(ii) The surface management agency, with the concurrence of the Fish and Wildlife Service, determines that the golden eagle nest(s) will be moved.

(iii) Buffer zones may be decreased if the surface management agency determines that the active eagle nests will not be adversely affected.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(l)(1) *Criterion Number 12.* Bald and golden eagle roost and concentration areas on Federal lands used during migration and wintering shall be considered unsuitable.

(2) *Exception.* A lease may be issued if the surface management agency determines that all or certain stipulated methods of coal mining can be conducted in such a way, and during such periods of time, to ensure that eagles shall not be adversely disturbed.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(m)(1) *Criterion Number 13.* Federal lands containing a falcon (excluding kestrel) cliff nesting site with an active nest and a buffer zone of Federal land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

(2) *Exception.* A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the falcon habitat during the periods when such habitat is used by the falcons.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(n)(1) *Criterion Number 14.* Federal lands which are high priority habitat for migratory bird species of high Federal interest on a regional or national basis, as determined jointly by the surface management agency and the Fish and Wildlife Service, shall be considered unsuitable.

(2) *Exception.* A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the migratory bird habitat during the periods when such habitat is used by the species.

(3) *Exemption.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(o)(1) *Criterion Number 15.* Federal lands which the surface management agency and the state jointly agree are fish and wildlife habitat for resident species of high interest to the state and which are essential for maintaining these priority wildlife species shall be considered unsuitable. Examples of such lands which serve a critical function for the species involved include:

(i) Active dancing and strutting grounds for sage grouse, sharp-tailed grouse, and prairie chicken;

(ii) Winter ranges most critical for deer, antelope, and elk; and

(iii) Migration corridors for elk. A lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected.

(2) *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(p)(1) *Criterion Number 16.* Federal lands in riverine, coastal and special floodplains (100-year recurrence interval) on which the surface management agency determines that mining could not be undertaken without substantial threat of loss of life or property shall be considered unsuitable for all or certain stipulated methods of coal mining.

(2) *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(q)(1) *Criterion Number 17.* Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable.

(2) *Exception.* A lease may be issued where the surface management agency in consultation with the municipality (incorporated entity) or the responsible governmental unit determines, as a result of studies, that all or certain stipulated methods of coal mining will not adversely affect the watershed to any significant degree.

(3) *Exceptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(r)(1) *Criterion Number 18.* Federal land with National Resource Waters, as identified by states in their water quality management plans, and a buffer zone of Federal lands 1/4 mile from the outer edge of the far banks of the water, shall be unsuitable.

(2) *Exception.* The buffer zone may be eliminated or reduced in size where the surface management agency determines that it is not necessary to protect the National Resource Waters.

(3) *Exemptions.* This criterion does not apply to lands: To which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

[44 FR 42638, July 19, 1979, as amended at 47 FR 33148, July 30, 1982; 48 FR 54820, December 7, 1983]

Underground mining exemption from criteria.

(a) Federal lands with coal deposits that would be mined by underground mining methods shall not be assessed as unsuitable where there would be no surface coal mining operations, as defined in 3400.0-5 of this title, on any lease, if issued.

(b) Where underground mining will include surface operations and surface impacts on Federal Lands to which a criterion applies, the lands shall be asssessed as unsuitable unless the surface management agency finds that a relevant exception or exemption applies.

[44 FR 42683, July 19, 1979, as amended at 47 FR 33149, July 30, 1982]

APPENDIX B

LAWS AND AGENCIES MITIGATING COAL RELATED IMPACTS

APPENDIX B

LAWS AND AGENCIES MITIGATING COAL RELATED IMPACTS

Laws and Agencies Mitigating Coal-Related Impacts

Law—Agency	Purpose	Major Relevance
Mineral Leasing Act of 1920 MLA	Changed policy from selling coal lands to the leasing of coal lands. Rights to explore, develop, and remove coal were acquired though a lease issued by BLM. Act gave Secretary of Interior authority for stipulation for Federal coal leases.	Act gave Secretary of Interior authority for formulating and including stipulations for Federal coal leases.
Federal Coal Leasing Amendments Act of 1976 (FCLAA)	To provide a more orderly procedure for the leasing and development of coal presently owned by the United States.	Act ratified the BLM practice of preparing land-use plans before issuing competitive coal leases.
Federal Land Policy and Management Act of 1976 (FLPMA)	Provides a comprehensive statutory statement of purposes, goals, and authority for the use and management of federally owned land administered by the Secretary of Interior through the BLM.	Title II of this Act provides BLM with a statutory mandate for land-use planning for public lands. Land-use plans must address: principles of multiple use and sustained yield. give priority to the protection of areas of critical environmental concern. consider present and future use of public lands. coordinate planning with that of Federal, state, and local agencies.
American Indian Religious Freedom Act of 1978	Establish policy to protect and preserve the right of American Indians to exercise their traditional religions	.Ensures that traditional native religions have the same religious freedom as other religions.
Mineral Leasing Act for Acquired Lands 1947	Governs leasing on federally acquired land for coal and other minerals covered by the Mineral Leasing Act of 1920.	This Act requires consent of the Federal agency having surface management of the land before BLM can lease the land for coal. Otherwise, leasing and operations provisions are the same as those for non-acquired lands.

Law-Agency	Purpose	Major Relevance
Surface Mining Control and Reclamation Act of 1977 (SMCRA)	Established a detailed national program for regulating surface coal mining and reclamation.	Act requires that surface coal mining be conducted in accordance with environmental protection performance standards and that Federal lands be reviewed to determine their suitability for all or certain types of surface mining, either as a part of land-use planning at the Federal, state, and local levels, or as a result of an unsuitability petition.
Antiquities Act of 1906	Regulates antiquities excavation and collection (including fossil remains). Protects historical values on public land.	Mitigates potential harm to historical, archaeological, and paleontological resources.
Archaeological and Historical Preservation Act of 1974	Provides for recovery of archaeological and historical data endangered by Federal or federally related activity, permit or license.	Mandates archaeological and historical data recovery with Federal or or federally related activity, activities or programs, and authorizes construction related funding.
Bald Eagle Protection Act of 1969, as amended	Protects bald and golden eagles.	May make certain coal lands off-limits for development.
Clean Air Act, as amended	Establishes requirements for areas failing to attain National Ambient Air Quality Standards (NAAQS). Provides for prevention of significant deterioration of areas where air is cleaner than NAAQS.	Limits industrial development within and adjacent to areas exceeding NAAQS and areas preserving clean air quality.
Clean Water Act of 1977	Establishes effluent limitations for new and existing industrial discharges into U.S. waters. Limitations set for public treatment discharges, with pretreatment by industrial users. Provides mechanism to restore and maintain integrity of the nation's waters.	May reduce development options in areas where antidegradation policy restricts discharges into high-quality waters. Treatment facilities in areas with rapidly expanding infrastructures must meet water quality standards. Effluent standards apply to coal mining point sources. U. S. Army Corps of Engineers Protection of wetlands.
Executive Order 11988	Provides for floodplain management	Floodplain management
Executive Order 1190	Provides for protection of wetlands.	Protection of wetlands.
Endangered Species Act of 1973, as amemded	Protects endangered and threatened species and critical habitat from Federal activities. Requires prior consultation with U.S. Fish and Wildlife Service.	May make certain coal lands unsuitable for development.
Fish and Wildlife Coordination Act of 1934	Requires consultation about water resource development actions that might affect fish or associated wildlife resources.	Mitigates potential Federal coal development impacts.
Migratory Bird Treaty Act of 1936, as amended.	International treaty which protects migratory birds.	Portects any migratory bird species which utilize the lease area.
National Historic Preservation Act of 1966, as amended	Establishes a system of evaluating the significance of cultural resources and creates a President's Advisory Council on Historic Preservation.	Requires Federal agencies to provide for the protection of cultural resources listed in, or eligible for, the National Register of Historic Places, and requires agency con-

Law-Agency	Purpose	Major Relevance
		sultation with the Advisory Council prior to authorizing, licensing, or funding a project that may impact cultural resources.
National Environmental Policy Act of 1969 (NEPA)	Makes environmental protection part of the mandate of every Federal agency. Requires impact statements for major Federal actions with potentially significant impacts.	Provides legislative authority to control energy development on environmental grounds. Impact statement process must be integral part of coal leasing system.
Mining and Minerals Policy Act of 1970	Declares congressional minerals policy.	Provides broad, general principles for mineral resource development.
Noise Control Act of 1972	Requires publication of information on limits of noise required to protect public health and welfare. Preempts local control of railroad equipment and yard noise emissions.	Regulations may be proposed to control coal mining areas and activities.
Resource Conservation and Recovery Act of 1976	Establishes guidelines for collection, transport, separation, recovery, and disposal of solid waste.	Mining locations may be affected by EPA regulations governing disposal of coal mining wastes.
Safe Drinking Water Act of 1977	Establishes mechanism for National Primary Drinking Water Standards.	EPA conducting study of the impacts of pits, ponds, lagoons, etc., on underground water supplies for public water systems.
Soil and Water Resources Conservation Act of 1977	Requires appraisal by Secretary of Agriculture of information and expertise on conservation and use of soils, plants, woodlands, etc.	Provides opportunity for expanded data base.
Multiple-Use Sustained Yield Act of 1960	Requires management of national forests under principles of multiple use so as to produce a sustained yield of products and services.	Mandates land management principles similar to those required by FLPMA
National Forests Management Act of 1976	Provides for a comprehensive system of land and resource management planning for National Forest System lands.	Key factor in the Department of the Interior's determination of where coal leasing would occur.
Forests and Rangeland Resources Planning Act of 1974	Provides for a comprehensive system of land and resource management planning for National Forest System lands.	Key factor in the Department of the Interior's determination of where coal leasing would occur.
Archaeological Resource Protection Act of 1979	Provides major penalties and a specific definition of archaeological resources.	Updates and expands protection of archaeological and historical resources beyond that provided for in the Antiquities Act of 1906.
Department of Energy Organization Act of 1977	Transfers authority to issue some coal regulations from DOI to DOE, including production regulations. DOE determines long-term national coal production goals.	Limits coal management authority exercised by the Department of the Interior. Requires program to establish proper coordination mechanisms.
Restriction of Mining in National Parks, Act of September 28, 1976 (P.L. 94-429)	Provides for the regulation of mining activity within, and to repeal the application of mining laws in, areas of the National Park System.	Requires recognition and protection of nationally significant natural areas as they relate surface mining.

Law-Agency	Purpose	Major Relevance
Colorado Department of Health		
--Water Quality Control Committee	Establishes and administers water quality standards in state waters.	Requires site review and permit issuance for projects involving water, sewage, and waste disposal. Establishes criteria for erosion control dams.
--Air Quality Control Commission	Establishes and administers air quality standards.	Requires mines to use dust preventative measures in all mining procedures, including construction.
--State Land Use Committee	Protects the utility, value, and future of all lands within the state, including the public domain and privately owned land. Provides for the protection of historical, natural, or archaeological values and for data recovery.	Local governments have the duty to identify, designate, and administer such areas and activities of state interest, including mineral resource areas and mining. Establishes areas containing or having significant impacts on historical, natural, or archaeological resources as being of state interest. BLM must coordinate with State Historic Preservation Officer before approving mining plans or rights-of-way.
Colorado Department of Natural Resources		
--Division of Mines	Provides for mine safety.	Monitors mine safety practices.
--Mined Land Reclamation	Provides for the reclamation of land subjected to surface disturbance by mining, thereby conserving natural resources, protecting wildlife and aquatic resources, and establishing recreation, home, and industrial sites to protect and perpetuate the taxable value of property. Mitigates impacts, assures reclamation, perpetuates existing regulations, and ensures that Colorado can carry out the intent and purposes of SMCRA.	Mine operator must obtain a permit. A plan of operations must be submitted, which includes a reclamation section. The board must hold public hearings and the involved county must approve issuance of a permit. Provides strict time frames for administering permitting provisions. Performance standards require restoring disturbed lands to a condition equal to or better than before mining, returning disturbed lands to the approximate original contour, stabilizing and protecting all surface areas during and after mining, reducing disturbances to the prevailing hydrologic balance, and protecting alluvial valley floors. In addition, the Colorado act applies to "surface operations and surface impacts incident to an underground coal mine." Underground operations must comply with most of the detailed performance standards for surface mines, even though special performance standards such as preventing material damage by subsidence are developed for some aspects of underground operations (Colorado Revised Statutes 1979).

APPENDIX C

COAL LEASE FORM (PROPOSED ACTION AND PREFERRED ALTERNATIVE)

Form 3400-12
(April 1984)
(Formerly 3520-1)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

COAL LEASE

Serial Number

PART I. LEASE RIGHTS GRANTED

This lease, entered into by and between the UNITED STATES OF AMERICA, hereinafter called lessor, through the Bureau of Land Management, and *(Name and Address)*

Consolidation Coal Company
Consol Plaza
Pittsburgh, Penn. 15241

hereinafter called lessee, is effective *(date)* , for a period of 20 years and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms at the end of the 20th lease year and each 10-year period thereafter.

Sec. 1. This lease is issued pursuant and subject to the terms and provisions of the:

☐ Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

☐ Mineral Leasing Act for Acquired Lands, Act of August 7, 1947, 61 Stat. 913, 30 U.S.C. 351-359;

and to the regulations and formal orders of the Secretary of the Interior which are now or hereafter in force, when not inconsistent with the express and specific provisions herein.

Sec. 2. Lessor, in consideration of any bonuses, rents, and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants and leases to lessee the exclusive right and privilege to drill for, mine, extract, remove, or otherwise process and dispose of the coal deposits in, upon, or under the following described lands:

T2N, R93W 6PM

Sec.2: W1/2SE1/4, SW1/4, S1/2NW1/4, SW1/4NE1/4
Lots 2,3,4
Sec.3: All
Sec.4: Lots 1,23, SE1/4
Sec.10: Lots 7,9,11,27,29, N1/2NE1/4
Sec.11: Lots 1,3,6,7,9,10, NW1/4, W1/2E1/2
Sec.14: W1/2NE1/4, W1/2
Sec.15: E1/2W1/2, E1/2

T3N, R93W, 6PM

Sec.25: S1/2SW1/4
Sec.27: S1/2
Sec.28: Lot 22, NE1/4SE1/4
Sec.33: 1,12,13,16,24,26
Sec.34: Lots 1,4 E1/2NW1/4,SW1/4,
E1/2
Sec.35: All
Sec.36: W1/2

containing acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and the right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

PART II. TERMS AND CONDITIONS

Sec. 1. (a) RENTAL RATE - Lessee shall pay lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate of $ for each lease year.

(b) RENTAL CREDITS - Rental shall not be credited against either production or advance royalties for any year.

Sec. 2. (a) PRODUCTION ROYALTIES - The royalty shall be percent of the value of the coal as set forth in the regulations. Royalties are due to lessor the final day of the month succeeding the calendar month in which the royalty obligation accrues.

(b) ADVANCE ROYALTIES - Upon request by the lessee, the authorized officer may accept, for a total of not more than 10 years, the payment of advance royalties in lieu of continued operation, consistent with the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons determined in the manner established by the advance royalty regulations in effect at the time the lessee requests approval to pay advance royalties in lieu of continued operation.

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease bond in the amount of $ The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 4. DILIGENCE - This lease is subject to the conditions of diligent development and continued operation, except that these conditions are excused when operations under the lease are interrupted by strikes, the elements, or casualties not attributable to the lessee. The lessor, in the public interest, may suspend the condition of continued operation upon payment of advance royalties in accordance with the regulations in existence at the time of the suspension. Lessee's failure to produce coal in commercial quantities at the end of 10 years shall terminate the lease. Lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after lease issuance.

The lessor reserves the power to assent to or order the suspension of the terms and conditions of this lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

Sec. 5. LOGICAL MINING UNIT (LMU) - Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval will supersede the relevant inconsistent terms of this lease so long as the lease remains committed to the LMU. If the LMU of which this lease is a part is dissolved, the lease shall then be subject to the lease terms which would have been applied if the lease had not been included in an LMU.

Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION - At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of lessor, the leased premises and all surface and underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall allow lessor access to and copying of documents reasonably necessary to verify lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 7. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS - Lessee shall comply at its own expense with all reasonable orders of the Secretary, respecting diligent operations, prevention of waste, and protection of other resources.

Lessee shall not conduct exploration operations, other than casual use, without an approved exploration plan. All exploration plans prior to the commencement of mining operations within an approved mining permit area shall be submitted to the authorized officer.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation to any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users. Lessee shall take measures deemed necessary by lessor to accomplish the intent of this lease term. Such measures may include, but are not limited to, modification to proposed siting or design of facilities, timing of operations, and specification of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of lessee as may be consistent with concepts of multiple use and multiple mineral development.

Sec. 8. PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY - Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at lease twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergencies; and take measures necessary to protect the health and safety of the public. No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor. Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

Sec. 15. SPECIAL STIPULATIONS -

Sec. 9. (a) TRANSFERS

☐ This lease may be transferred in whole or in part to any person, association or corporation qualified to hold such lease interest.

☐ This lease may be transferred in whole or in part to another public body or to a person who will mine the coal on behalf of, and for the use of, the public body or to a person who for the limited purpose of creating a security interest in favor of a lender agrees to be obligated to mine the coal on behalf of the public body.

☐ This lease may only be transferred in whole or in part to another small business qualified under 13 CFR 121.

Transfers of record title, working or royalty interest *must* be approved in accordance with the regulations.

(b) RELINQUISHMENT - The lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon lessor's acceptance of the relinquishment, lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

Sec. 10. DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC. - At such time as all portions of this lease are returned to lessor, lessee shall deliver up to lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the lessor, but lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the lessor. If the surface is owned by third parties, lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by lessee's activity or activities incidental thereto, and reclaim access roads or trails.

Sec. 11. PROCEEDINGS IN CASE OF DEFAULT - If lessee fails to comply with applicable laws, existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time.

Sec. 12. HEIRS AND SUCCESSORS-IN-INTEREST - Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

Sec. 13. INDEMNIFICATION - Lessee shall indemnify and hold harmless the United States from any and all claims arising out of the lessee's activities and operations under this lease.

Sec. 14. SPECIAL STATUTES - This lease is subject to the Federal Water Pollution Control Act (33 U.S.C. 1151—1175), the Clean Air Act (42 U.S.C. 1857 et. seq.), and to all other applicable laws pertaining to exploration activities, mining operations and reclamation, including the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et. seq.).

Sec. 15. SPECIAL STIPULATIONS (Cont'd) -

	THE UNITED STATES OF AMERICA
	By
Company or Lessee Name	
(Signature of Lessee)	(Signing Officer)
(Title)	(Title)
(Date)	(Date)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

☆U.S. Government Printing Office: 1984—444-338/

Section 15

Special Stipulations

Proposed Action

In addition to observing the general obligations and standards of performance set out in the current regulations, the lessee shall comply with and be bound by the following special stipulations. These stipulations are also imposed upon the lessee's agents and employees. The failure or refusal of any of these persons to comply with these stipulations shall be deemed a failure of the lessee to comply with the terms of this lease. The lessee shall require his agents, contractors and subcontractors involved in activities concerning this lease to include these stipulations in the contracts between and among them. These stipulations may be revised or amended, in writing, by the mutual consent of the lessor and the lessee at any time to adjust, to change conditions, or to correct an oversight. The lessor may amend these stipulations at any time without the consent of the lessee in order to make them consistent with any new Federal or state statutes and the regulations promulgated under authority or new statutes.

All stipulations concerning compliance with the requirements of the Surface Mining Control and Reclamation Act will be included in the document approving the mining plan.

BLM's Preferred Alternative

Same as the Proposed Action.

Wildlife

Proposed Action

1. The lessee shall mitigate for mule deer, elk, and sage grouse habitat loss where applicable, and the resultant loss or displacement of these species, due to surface coal mining operations.

2. Concurrently with the filing of its mine plan, the lessee shall submit for approval to the Bureau of Land Management (BLM) a habitat recovery and replacement plan for protection or enhancement of mule deer, elk, and sage grouse populations affected by habitat loss or displacement from historical habitat. The habitat recovery and replacement plan shall include:

A. An analysis of the permit area which:

(1) Identifies the wildlife species that occupy the permit area, and
(2) Includes an analysis of the quality carrying capacity of the habitat for these species.

B. A detailed description of the methods selected by the lessee to mitigate habitat loss, together with a comparative analysis of alternate methods, which were considered and rejected by the lessee and the rational for the decision to select the proposed methods.
The methods utilized by the lessee for recovery and replacement may include, but are not limited to, the following techniques:

Increasing the quantity and quality of forage available to wildlife;
Leasing, entering into formal agreements with managing agencies of public land, or purchasing lands in sufficient quantity to mitigate mining impacts on a schedule that anticipates actual surface disturbance on a replacement basis satisfactory to BLM;
Purchasing or leasing lands suitable for enhancement as elk calving habitat;
Fencing primary roads and construct highway underpasses in areas identified as primary elk crossings.

C. A monitoring program that contains the following topics and commitments:

(1) Long-term changes in elk distribution and range use in response to mining disturbance will be monitored by means of a on-going program of elk capture and telementry monitoring.

Wildlife

BLM's Preferred Alternative.

1.The lessee shall provide 100 percent in-kind habitat value mitigation (no net loss of habitat value) for elk, and riparian/wetland habitat. For all mining related development of which the PRLA is a part, a mitigation plan outlining specific methodologies will be submitted to BLM for approval (as outlined in stipulation 2). Prior to any surface disturbing activities the lessee shall demonstrate to BLM that use of a land base adequate to accomplish this has been secured by the lessee.

2.Same as the Proposed Action.

(2) Response of elk to habitat enhancement treatments will be monitored through comparison of levels of elk use at treatment areas verus control areas using a pellet group plot index to elk use. Radio-collared elk will be monitored at levels necessary to determine preferences for treatments or control areas.
(3) Vegetative cover, production, diversity, and levels of erosion resulting from treatments will be monitored to detect differences in these parameters, between treatment and control areas.
(4) Monitoring of erosion features and vegetative characteristics.

D. A timetable giving the periods of time that will be required to accomplish the habitat recovery or replacement plan and showing how it relates to the overall mining plan

E. An evaluation of the final plan by the CDOW. If the state has recommended an alternate method, the lessee shall consider the state's recommendation and, if the lessee rejects the state's plan, the lessee shall indicate its reasons. If no state comment is included in the plan, the lessee shall verify its consultation with the state and the plan may be considered without state comment.

3. No direct surface disturbance will occur within impact avoidance elk concentration areas, elk calving areas and range suitable as winter or year-round elk habitat areas identified in figure 3-1 of the lessee's Mitigation Plan (Appendix C) in which the lessee holds an interest as a result of development. (Ninemile Gap winter and transitional ranges and a calving area south of Ninemile Gap.) For those areas shown and described in the legend of figure 3-1 of Appendix C, except for the area described as the "mine area," no surface occupancy will be allowed until such time as:

(1) The habitat removed by mining has returned to its premining value.
(2) Any disturbance is compensated for by some form of mitigation.

With the exception that:
Remote support facilities for underground mining in the elk avoidance areas may be allowed if:
1. It is reasonably demonstrated that the facility will not effect any important elk use of the avoidance area; and
2. The disturbance is compensated for by in-kind mitigation.

3. No impacts to raptors or raptor nests will be permitted except as specifically authorized by the USFWS and the CDOW. Impacts to raptors or raptor nests sites will be identified prior to surface disturbance. The lessee in consultation with USFWS and CDOW shall:
A. Develop site-specific plans to avoid and/or mitigate adverse impacts to raptor species.
B. Annually monitor changes in nesting raptor densities and productivity in response to permining and postmining development through out the project area.

C. Monitor success of any mitigation that may be developed through avifauna impacts studies (if determined to be needed during the permitting process).

4. As part of the Permit Application Package, the lessee shall submit to OSMRE an estimate of the expected average annual water depletions to the Upper Colorado River Basin that will be caused by the mining operation. The estimate will be reviewed as part of the Section 7 (Endangered Species Act) consultation process.The lessee may be required, through Section 7, to adopt measures or alternatives as part of the permitted mining operation to preclude or avoid any adverse impacts on endangered fish species in the Upper Colorado River Basin.

5. The lessee shall work with CDOW to develop an employee program to inform workers of Colorado statutes regarding fish and game specific mitigative measures (including firearms and activity restrictions) developed to prevent illegal harvest on the lease. In addition, an incentive program will be developed by lessee

to encourage compliance with these statutes and mitigative restrictions and cooperation with CDOW in apprehending offenders.

6. Unless inconsistent with requirements identified during the permitting process, the lessee shall design postmining land forms to enhance characteristics of areas designed for elk calving and rearing, while sustaining or expanding the extent of south and west facing slopes that would be suitable for development as winter range or transitional stage.
A. At a finer scale to topographic relief, slope surfaces will be shaped to produce a system of convex and concave surfaces prior to redress of topsoil to produce topographic escape cover for elk, and to produce broad swales interconnected downslope with other swales, water impoundments and larger drainage features.
B. North-facing slopes designated for calving/rearing use will include nearly level terrace or bench surfaces intended to serve as feeding or bedding areas.
C. Open water areas will be replaced with small impoundments designed to catch spring snowmelt, runoff, and groundwater discharge. Impoundments will be located in the lower reaches of drainages within the elk calving/rearing areas. Water sources for elk will be supplied in topographically higher sectors.

Soils and Vegetation

Proposed Action

4. Soil depths will vary by vegetation, i.e., minimum depths of 2 feet for aspen stands, 18 inches for shrubland mosaic communities, and 12 inches for grassland areas would provide functional soil resource similar to resource presently utilized by indigenous vegetation.

5. Vegetation will be reestablished in approximately the same areal extent of each vegetative type, as prior to mining. Revegetation goals of establishing a self-sustaining vegetative cover will be met by transplanting root zone material (with a modified front end loader), seeding, planting bare root materials, special topsoil management (avoidance of topsoil storage and rotary clearing of vegetation), and fencing where necessary to protect from wildlife.

Soils and Vegetation

BLM's Preferred Alternative

7. If sufficient quantities of topsoil are confirmed by the detailed soil survey, the following depth will apply; otherwise, the exact topsoil depths determination will be deferred until mine plan.

Under proposed aspen stands the topsoil will be replaced to natural depths as determined by the detailed soil survey, or 30 inches (2.5 feet), whichever is less.

8. Prior to surface disturbance of aspen soils, the lessee shall conduct studies on aspen reclamation techniques, including but not limited to creation of perennial seep areas. Actual study parameters, i.e., objectives, location, timeframe, size, will be deferred to the mining permitting process. If techniques can be developed that show statistical improvements in reclaimed aspen densities or growth and creation of alternate water sources, they will be incorporated into the overall reclamation plan. Aspen reclamation techniques which are proven elsewhere between the time of this analysis and mine construction, may be incorporated into the reclamation plan without reanalyzing them. As part of the required studies of aspen reclamation techniques, the lessee will compare with the use of segregated topsoil with use of combined

soil from various vegetation types and locations. If separately handled aspen soils show statistical improvements in reclaimed aspen densities and growth over other combined soils, pre-mining aspen soils will be separately handled to areas of the backfill where aspen are to be reestablished.

9. Soil removed from aspen sites will be: 1) placed immediately on regraded backfill where aspen will be established, or 2) stockpiled separately and redistributed in areas where aspen will be established, unless Consol can demonstrate this practice is not necessary to protect the productivity of these soils, and ensure aspen reclamation.

10. Organic matter analysis, microbial populations and diversity, and carbon nitrogen ratios will be conducted on premine soils and redistributed topsoils.

11. The lessee shall:

A. Reestablish vegegation in approximately the same areal extent of each vegetative type, as prior to mining, with the following exceptions:

-Sagebrush shrublands shall be reestablished as mixed mountain shrubland, aspen woodland, mountain grassland, or riparian/wetlands.

-Reestablished riparian/wetlands may occupy a larger areal extent than premining conditions, but shall not occupy less areal extent than primary conditions.

-So long as no loss of riparian/wetland areas is incurred, post mining vegetation may be comprised of the following approximate percentages:

50 percent mixed mountain shrubland
25 percent aspen
25 percent mountain grassland

B. Conduct studies on the re-establishment or perennial seep areas.

C. Ensure that postmine aspen stands at bond release will occupy at least the same areal extent as premining stands and have at least 500 stems/acre, which are at least 5 feet in height and which have survived at least 5 years. This requirement may be replaced by another standard if the lessee can demonstrate to the satisfaction of the authorized officer after that an alternate standard will result in the reestablishment of aspen stands similar to those which existed prior to mining.

D. Meet revegetation goals of establishing a self-sustaining vegetative cover by transplanting root zone material, seeding, planting of bare root materials, special topsoil management (methods include avoidance of topsoil storage, and rotary clearing of vegetation), and fencing where necessary to protect from wildlife.E. Determine available moisture percentages (defined as the difference between 1/3 and 15 atmosphere moisture percentage) on all major areas of aspen soils prior to distrubance. Post aspen soils will duplicate these available moisture percentages as near as possible (the exact depth and variation from pre-disturbance soils values will be determined at mine plan stage)

Water Resources

Proposed Action

6. The lessee shall emphasize minimizing impacts to James Creek channel and floodplain. Where impacts are unavoidable, temporary stream modifications will be designed to safely pass the 100-year, 24-hour storm.

Water Resources.

BLM's Preferred Alternative

12. Same as Proposed Action number 6.

13. The lessee shall protect James Creek through the use of a buffer strip from all development related activities unless lessee can ensure that the post mining water quality and quantity in James Creek and the stability of the channel along James Creek will be protected. The exact boundaries of a buffer strip and other resources will be determined during the permitting process.

14. Unless precluded by other permitting requirements:
A. the lessee shall design sediment ponds to withstand a 40-year, 24-hour storm.
B. The lessee shall study the possible re-establishment of perennial seep areas and establish them if practicable.
C. The lessee shall terrace slopes adjacent to waterways. Design considerations must ensure that slopes remain stable. Exact standards will be determined during the mine permitting process.
D. The lessee shall design at least 20 percent of the sediment ponds to silt in following bond release and supply additional moist areas for riparian vegetation.

Cultural Resources

Proposed Action

No stipulations proposed.

Cultural Resources

BLM's Preferred Alternative

15. Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource intensive field inventory in a manner specified by BLM on portions of the mining plan area and adjacent areas, or exploration plan area, that may be adversely affected by lease related activities and which have not been previously inventoried at such a level of intensity.

A. The inventory will be conducted by a qualified professional cultural resource specialist (i.e., archaeologist, historian, or historical architect, as appropriate) approved by BLM, and a report of the inventory and recommendations for protecting any cultural resources identified shall be submitted to the Office of Surface Mining Reclamation and Enforcement (OSMRE)(*) and BLM(*). The lessee shall undertake measures, in accordance with instructions from OSMRE(*), to protect cultural resources on leased land. The lessee shall not commence the surface disturbing activities until permission to proceed is given by OSMRE(*).

B. The lessee shall protect all known cultural resources properties within the lease area from lease related activities until the cultural resource mitigative measures can be implemented as part of an approved mining and reclamation plan or exploration plan.

C. The cost of conducting the inventory, preparing reports, and carrying out mitigative measures shall be borne by the lessee.

D. If cultural resources are discovered during operations under a lease, the lessee shall immediately bring them to the attention of OSMRE(*) or the authorized officer of either the surface management agency if OSMRE or the BLM, as appropriate, is not available. The lessee shall not disturb such resources except as may be subsequently authorized by OSMRE(*). Within two (2) working days of notification,(OSMRE)(*)will examine or have examined any cultural resources discovered and will determine if any action may be required to protect or preserve such discoveries. The cost of data recovery for cultural resources discovered during lease operations shall be borne by the lessee unless otherwise specified by the authorized officer of BLM or the surface managing agency (if different).

E. All cultural resources shall remain under the jurisdiction of the United States until ownership is determined under applicable law.

(*)...or the BLM authorized officer if activities are associated with coal exploration outside an approved mining permit area.

Paleontological Resources

Proposed Action

No stipulations proposed.

Paleontological Resources

BLM's Preferred Alternative

16. The following stipulations will be used to protect paleontological resources:

A. Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall contact the authorized officer of the appropriate agency (state of Federal) to determine whether it will be required of the lessee to conduct and fund a paleontological appraisal of the mine plan, leasehold, or exploration plan area that may be adversely affected by lease-related activities. If one is required, the paleontological appraisal shall be conducted by a qualified paleontologist approved by theauthorized officer of the appropriate agency (state of Federal), using the published literature, and where appropriate, field appraisals for determining the possible existence of fossils of scientific significance. A report of the appraisal and recommendations for protecting any larger and more conspicuous fossils of significant scientific interest on the lease lands so identified shall be submitted to the authorized officer of the appropriate agency (state or Federal). When necessary to protect and collect the larger and more conspicuous fossils of significant scientific interest on the leased lands, the lessee shall undertake the measures provided in the approval of the mining and reclamation plan or exploration plan.

B. The lessee shall not knowingly disturb, alter, destroy, or take any larger and more conspicuous fossils of significant scientific interest, and shall, consistent with economic and safety considerations, protect such fossils in conformance with the measures included in the approval of the mining and reclamation plan or exploration plan.

C. The lessee shall immediately bring any such fossils that may be altered or destroyed by the operation to the attention of the Bureau of Land Management, as appropriate. Such fossils when discovered may be moved and operations may continue as long as the fossil specimen or specimens will not be seriously damaged or destroyed. The authorized officer of the appropriate agency (state of Federal) shall evaluate or have evaluated such discoveries brought to his attention and, within 5 working days after the fossil is brought to his attention, shall notify the lessee what action shall be taken with respect to such discoveries.

D. All such fossils of significant scientific interest shall remain under the jurisdiction of the United States until ownership is determined under applicable law. Copies of all paleontological resource date generated as a resultof the lease term requirements will be provided to the authorized office of the appropriate agency (state or Federal).

E. The cost of any required salvage of such fossils shall be borne by the United States.

Access

Proposed Action

No stipulations proposed.

Access

BLM's Preferred Alternative

17. The lessee shall maintain public access to public land adjacent to the lease by means of existing roads, trails, or ways. If the lessee must destroy or obstruct any existing route, the lessee shall provide an alternate route of equal quality. Public lands within the lease area and roads, trails, and ways constructed by the lessee shall be made accessible to the public unless such access would interfere with mining operations or create a safety hazard. Any additional limitation must be approved by BLM. Public access and public recreational opportunities, (including hunting) will be provided to any off-site lands pur

chased or leased for mitigative purposes in an amount equal to that lost from the PRLA due to development.

18. The lessee shall not disturb surface lands within 100 feet of the right-of-way of Rio Blanco County Road 30 or Colorado Highway 13/789, without written authorization from the affected road or highway department, except as allowed for under 43 CFR 3461, or provisions allowed for under Colorado Mined Land Reclamation rules.

APPENDIX D

DEVELOPMENT OF CONSOL'S PROPOSED ACTION AND THE ELK MITIGATION FEASIBILITY ASSESSMENT AND MITIGATION PLAN

APPENDIX D

DEVELOPMENT OF CONSOL'S PROPOSED ACTION AND THE ELK MITIGATION FEASIBLITY ASSESSMENT AND MITIGATION PLAN

CONSOL'S INITIAL SURFACE PROPOSAL

Consol made this development proposal in 1984. It reflects mine development and some mitigation and includes both the PRLA and adjacent Federal lease C-093713. Since 1984, Consol has defined its proposed mitigation, based on Camp, Dresser, and McKee's (CDM's) elk study and discussions with BLM and the Colorado Division of Wildlife.

The initial proposal that Consol submitted to BLM requested a 10-million-ton-per-year mine, with a mine life of 40 years. This initial proposal is outlined below. Consol provided both the discussion and map D-1.

Consolidation Coal Company, 1984 Meeker Mine Plan

In January 1984, Consol's Central Engineering Group developed a mine plan for the Meeker PRLA based on the following goals:

1.Maximum economic use of PRLA and surrounding Federal leases.

2.A continuous, 10-million-ton-per-year surface mine for up to 40 years, as the surface minable reserve allowed.

3.Placement of the support facilities and structures to provide the most economical operation of the surface mine.

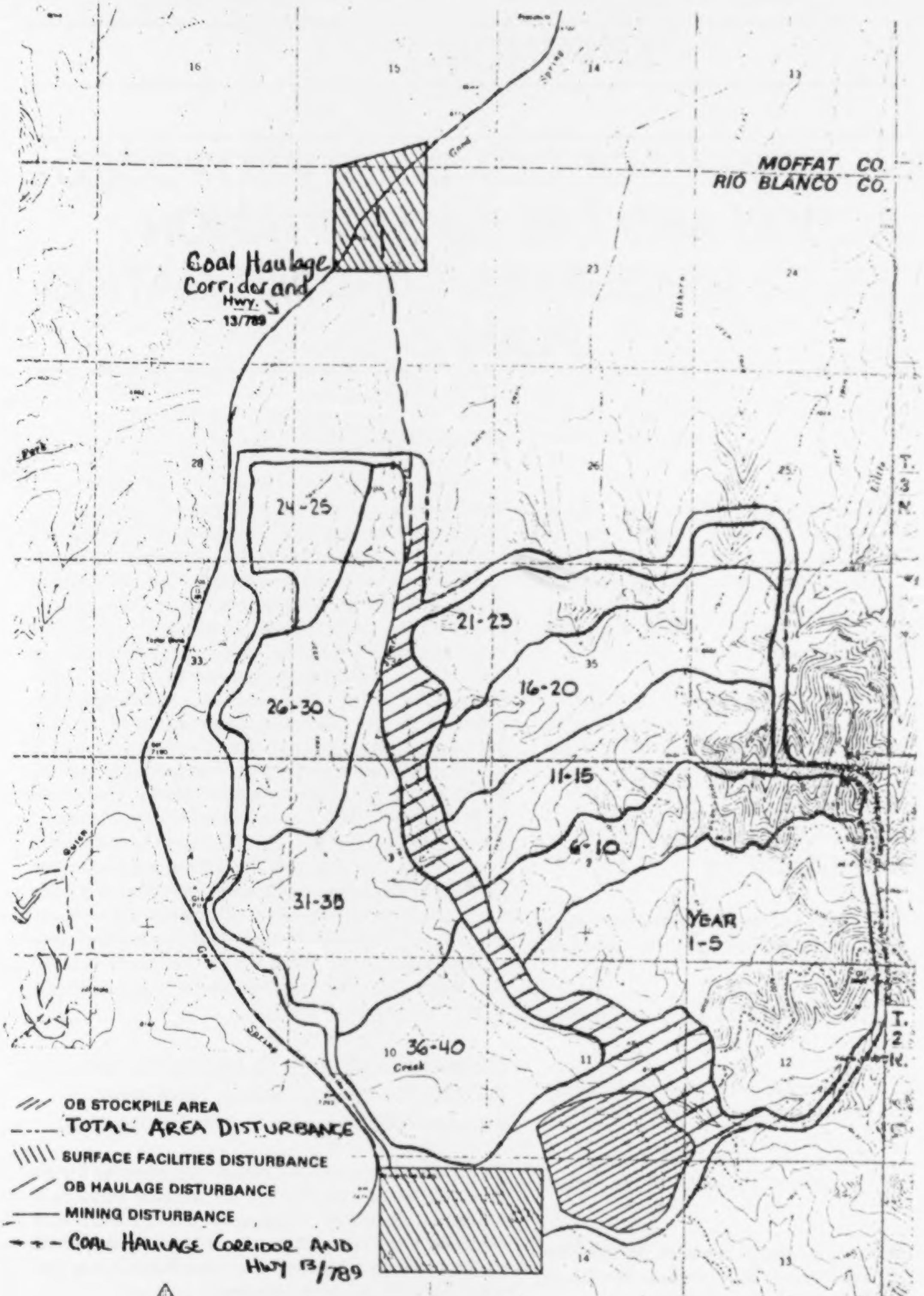
No specific environmental constraints were identified for this plan, except minimizing disturbance to the James Creek channel and floodplain.

The resultant mine plan is illustrated in map D-1. Production would increase by 2 million tons per year until mining year 5. At that time the roduction rate of 10 million tons per year would be achieved. This rate would be maintained through mining year 40, the final coal production year. The overburden stockpile would be located at the headwaters of Good Spring Creek, and a portion of the stockpile would become permanent following backfilling of the final pit. Because of its gentle terrain, highway access, ease of access, and the most direct access to the mining areas, support facilities would be located in the Ninemile Gap area. Two transportation routes, shown in map D-1, were considered viable. One would be from James Creek to a loadout near the confluence of James and Good Spring creeks. The other would be from the Ninemile Gap area, with the railroad extended to the same area. This railroad option would be feasible if a side valley cut, starting near the confluence of Elkhorn and Good Springs creeks, was used. This plan involves mining approximately 368,000,000 tons of coal over the 40-year reserve life. This plan was presented at the January 1084 public scoping meeting.

Consol's Revisions to Accommodate Wildlife Concerns (which have been incorporated into its Current Proposal)

The review of possible mitigation opportunities for elk migration areas, described in the Meeker PRLA Elk Mitigation Feasibility Assessment (CDM 1984b), indicated that avoidance of the Ninemile Gap area may be the most technically sound approach to mitigation, and one achievable through mine planning.

As a result, new mine planning goals were added to the original list. These goals included:


16
15
14
13
Spring
Good
MOFFAT CO.
RIO BLANCO CO.
Coal Haulage
Corridor and
Hwy.
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/// OB STOCKPILE AREA
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// OB HAULAGE DISTURBANCE
—— MINING DISTURBANCE
- + - COAL HAULAGE CORRIDOR AND HWY 13/789
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Map D-1 Consol's Initial Surface Proposal

1. Deleting the Ninemile Gap transportation option.

2. Moving stockpiles, facilities, and access from Good Spring Creek and Ninemile Creek watershed "behind" the ridge separating the headwaters of James Creek and the headwaters of Good Spring Creek.

3. Stopping mining on the ridge between Good Spring Creek and James Creek to avoid interfering with elk movement in the Good Spring Creek valley or spillover into the Hole-in-the-Wall and West Fork Good Spring Creek calving/rearing areas.

This would eliminate the last 10 years of mining (approximately 100 million tons of coal) and would provide less than optimum locations for the overburden stockpile and support facilities.

Construction costs to prepare suitable facility areas within the James Creek drainage would be higher than in more topographically favorable Ninemile Gap area. It would be more cost efficient to base mining equipment in Ninemile Gap than in James Creek, as suggested in the initial proposal.

COMPARISON OF CONSOL'S INITIAL AND CURRENT SURFACE MINE PROPOSALS

A comparison of the impacted acreage of Consol's initial surface and current proposals is shown in tables D-1 and D-2. The area that has been avoided is shown on map D-2.

Seventeen coal seams, ranging from 3.5 to 35 feet thick, would be recovered.

TABLE D-1
IMPACTED HABITAT

Proposal	Acreage* of Potentially Impacted Habitat	
	Calving Areas	Winter Concentration Areas
Initial Surface Proposal	5,137	2,913
Consol's Present Proposal	4,750	1,226

*Buffer zones were superimposed around surface impacts as described in the Meeker PRLA Elk Mitigation Feasibility Assessment (CDM 1984b).

TABLE D-2
IMPACTED VEGETATION

Proposal	Acreage* of Potentially Impacted Vegetation Types					
	Mtn. Shrub	Sage	Aspen	Bunch-grass	Wet-land	Mtn. Grass-land
Initial Surface Proposal	4,510	884	1,282	93	183	145
Consol's Present Proposal	3,007	361	1,174	19	80	146

*No buffer zone was placed around surface impacts in computation of these acreages (CDM 1985).

Coal would be moved from the active pit to a proposed railroad loadout near the confluence of James Creek and Good Spring Creek. Consol is considering the following options for moving and crushing coal (BLM's analysis used option 1 as a worst-case analysis):

1. Hauling coal by 160-ton bottom dump trucks along James Creek to crushers located at the loadout facility; or

2. Crushing the coal before transporting it by conveyor along James Creek to the loadout facility.

To protect any developments in James Creek, stream modifications would be designed for all facilities to safely pass the 100-year, 24-hour storm. Coal at the loadout site would be stored in either enclosed silos or open bins (pending air quality considerations) before unit train loadout.

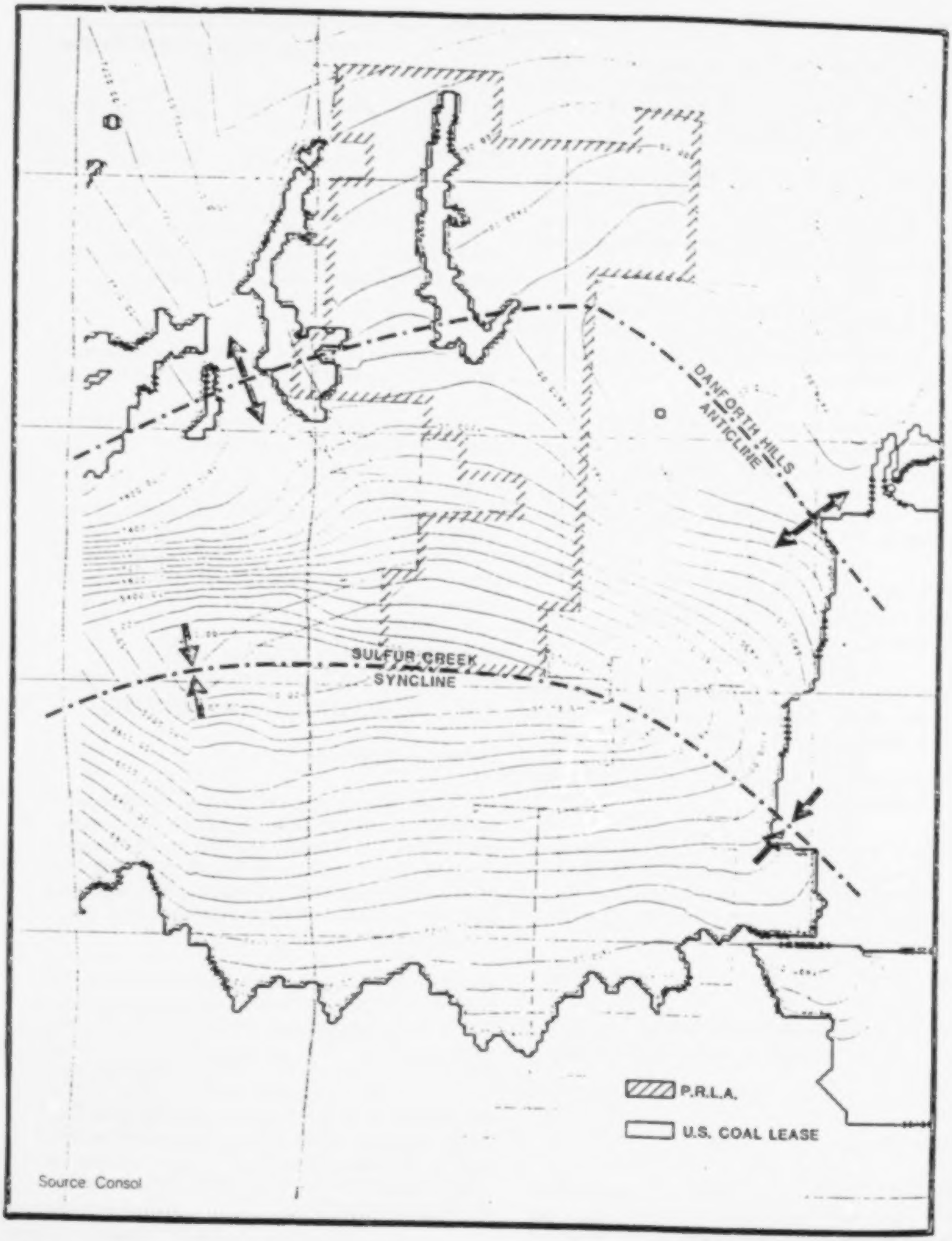
UNDERGROUND MINING AND SUMMARY OF IMPACTS ANALYZED IN THE ENVIRONMENTAL ASSESSMENT

Underground Mining

The following development scenario was based on information presented to BLM in 1977 by Consol for development of PRLA C-0126998. The data was analyzed and presented in an environmental assessment in 1982. The following brief description of Consol's underground mine plan comes from the environmental assessment of PRLA C-0126998, 1982.

Consol's initial mining concept consisted of the room-and-pillar and longwall extraction method using continuous miners and longwall equipment. Four portals, accessed by mine roads (approximately 20 feet wide), would enter the outcrop along both sides of James Creek. Conveyors would transport the mined coal from the portals to preparation and loading facilities along the floor of the James Creek valley. Surface support facilities, such as office buildings, warehouse, bathhouse, parking lot, supply yard, and storage silos, would also be located on the valley floor (map D-3).

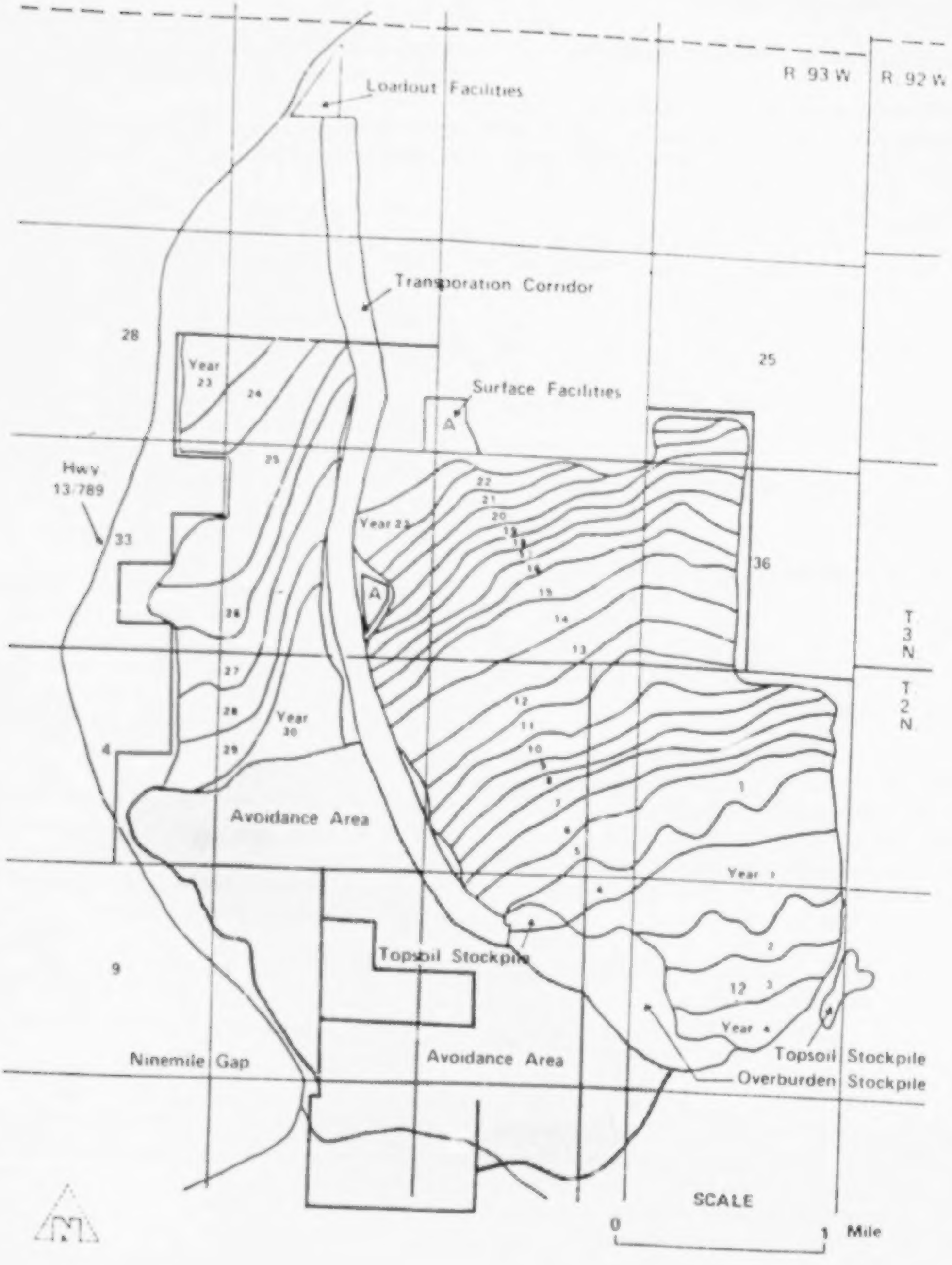
Ventilation would occur through the portal systems, so necessary ventilation shafts would not be required.


DANFORTH HILLS ANTICLINE
SULFUR CREEK SYNCLINE
P.R.L.A.
U.S. COAL LEASE

Source: Consol

Map D-2 Structure of the Last Mineable Seam

Scale 1" = 5,000'
0
5,000'
10,000'


R. 93 W.
R. 92 W.
Loadout Facilities
Transporation Corridor
28
25
Year 23
24
Surface Facilities
A
Hwy. 13/789
25
22
21
20
Year 22
19
18
17
16
33
15
36
A
26
14
13
T. 3 N.
T. 2 N.
27
28
Year 30
12
11
29
10
9
8
4
1
7
Avoidance Area
6
5
Year 1
4
Topsoil Stockpile
2
9
12
3
Year 4
Ninemile Gap
Avoidance Area
Topsoil Stockpile
Overburden Stockpile
SCALE
0
1 Mile
N

Map D-3 Area Disturbance by Year and Proposed FacilityAreas

General access to the mine headquarters would be by a haul road (about 40 feet wide) leading south from Colorado Highway 13/789 (T. 2 N., R. 93 W., section 22, SE 1/4 NW 1/4) up the James Creek Valley approximately 3 miles. Electrical lines to supply power to the mine would be located along this haul road.

Summary of Impacts of Underground Mining

The following summarizes the notable potential and imminent impacts of the underground mining plan. This summary does not include suggested mitigative practices, nor does it include all current information. It is presented for the readers information and summarizes the results of previous analysis. Complete details on impacts and mitigation are contained in the 1982 Environmental Assessment on this PRLA, which is available for review at the Colorado State, Craig District, and White River Resource Area offices of the BLM.

1. Soil profile destruction and removal of soil material through construction, on about 100 acres.

2. Removal of vegetation from about 100 acres to accommodate mining facilities.

3. Direct loss, through vegetation removal, of about 100 acres of elk critical winter habitat and spring through fall deer habitat.

4. Removal and marketing of 29 million tons of coal from total PRLA reserves.

5. Undetermined potential for adverse hydrologic impacts to the James Creek area resulting from an unknown degree of subsidence and groundwater percolation. In a worst-case situation, local stream flow, springs, and seeps could be interrupted or lost, which could inflict significantly adverse impacts to local agricultural, rangeland, and wildlife habitat use.

6. Alteration (direct or indirect loss) of 30 or less acres of riparian and wetland vegetation.

7. Short-term displacement of beaver, where they occur adjacent to mine facilities.

8. Disturbance of deer and elk from a zone surrounding the mine facilities, preventing optimal use of forage, cover, and water resources available on approximately 1,400 acres. Successful mitigative attempts, as outlined, would partially to fully compensate elk and mule deer habitat loss by enhancing adjacent, unaffected ranges, but habitat loss and animal displacement would still occur locally at the mine site. The degree of mitigative success is impossible to predict.

9. Undetermined escalation of deer and elk road kills, poaching, and habitat degradation related to human population influx, and anticipated rises in game damage to agricultural crops.
MAP D-3

10. Loss of approximately 100 livestock animal unit months annually through mine life and short-term inaccessibility to key grazing areas along lower James Creek.

11. Possible destruction of unknown subsurface cultural or paleontological remains.

12. Visual domination of facilities, roads, etc., would visually dominate the landscape of the valley floor.

13. Increase in social impacts as a result of population increases of 3 percent in Meeker and 4 percent in Craig over the 1987 population base line.

14. Increase in local population and in tax revenues from increased business activity. The increase in employment would add to the area's dependence on the energy mineral industry.

Coal Reserves Suitable for Underground Mining

Based on data supplied by Consol in its initial showing, underground reserves were estimated to be approximately 14.9 million tons. Coal seams between 4 and 14 feet thick could be mined to a maximum depth of 1,500 feet, and minimum interburden thickness between coal seams would be 40 feet. Approximately 50 percent of the seams mined by underground methods would be recovered.

Consol provided several different estimates of tonnages to BLM over the years, based on different analyses of the reserves. Subsequently, different figures were used in the EA than in the initial showing, and a third set of figures are used in Consol's current proposal.

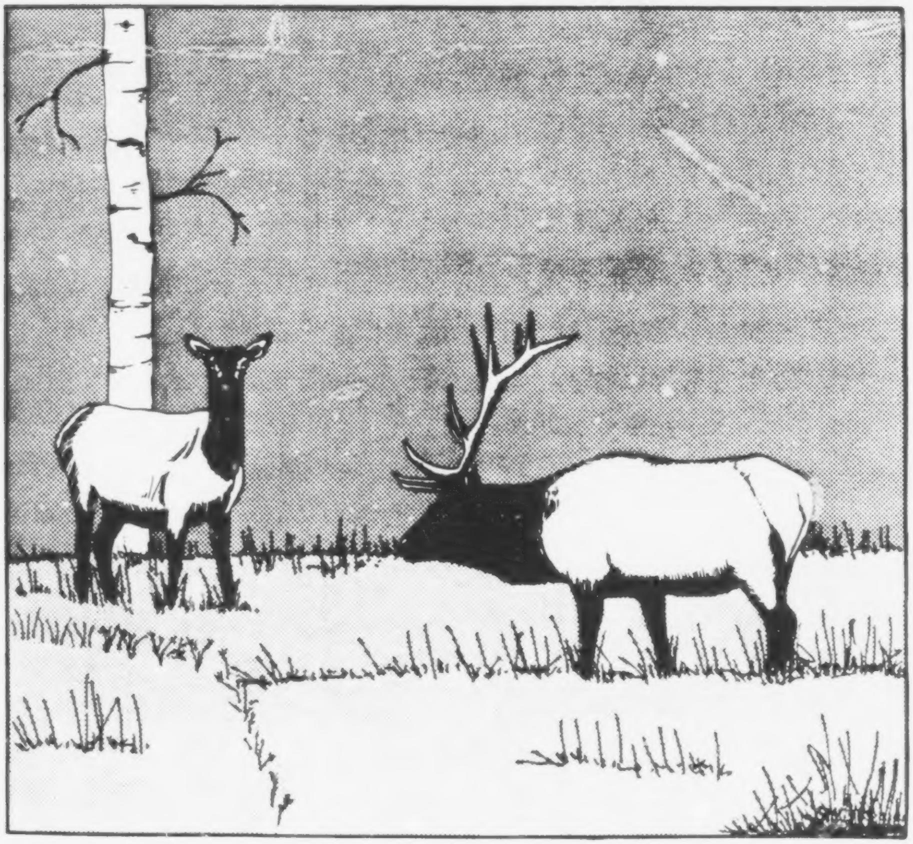
Meeker PRLA
Elk Mitigation Feasibility Assessment and Mitigation Plan

CONSOL

Consolidation Coal Company

Meeker Mine Plan

See Section 4



environmental engineers, scientists, planners & management consultants **CDM**

MEEKER PRLA ELK MITIGATION STUDY

MITIGATION ASSESSMENT AND PLAN

PREPARED FOR:

CONSOLIDATION COAL COMPANY
CONSOL PLAZA
PITTSBURGH, PENNSYLVANIA 15241

PREPARED BY:

CAMP DRESSER & McKEE INC.
2300 15TH STREET, SUITE 400
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DECEMBER 1984

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Co-Investigator Hydrology

3.0 MITIGATION PLAN

The mitigation plan for the Meeker PRLA presented in this section incorporates results and recommendations of analyses described in Section 2 as committed mitigation measures. That is, Consol management is committed to the necessary land acquisition, habitat development, reclamation, and monitoring to fully implement and develop this plan. The purpose of this section is to describe mitigation commitments at a level of detail which provides BLM, CDOW, and interested public an adequate basis for decisions concerning effectiveness of proposed mitigation measures, based on information presented in the previous sections of this report.

3.1 IMPACT AVOIDANCE COMMITMENTS

Through use of impact avoidance strategy described in Section 2.3.1 an economically viable mine plan was developed for the Meeker PRLA and Federal Lease C93713 (Map 4-1, Section 4) which incorporated avoidance of 3,903 acres of elk winter concentration areas, 3,002 acres of elk calving areas and 1,888 acres of range suitable as winter or year around elk habitat (Table 3-1). No direct surface disturbance will occur within impact avoidance areas identified in Figure 3-1 as a result of Consol's proposed development.

These avoidance areas include Ninemile Gap winter and transitional ranges and a calving area south of Ninemile Gap which occurs within the boundaries of Federal Coal Leases C93716, C93715, and C93714 (Section 2).

3.2 OFF-SITE COMPENSATORY HABITAT ENHANCEMENT COMMITMENTS

Annual and annual cummulative impacts of the mine plan on elk winter concentration areas and calving areas at the Meeker PRLA (including avoidance commitments) were determined through SAGIS analysis described in Section 2.2. Results of this analysis are presented in Table 3-2. These results demonstrate the annual need for elk winter concentration and calving area replacement over the life of the proposed mine assuming no credit for reclamation, which is scheduled to proceed behind the advancing

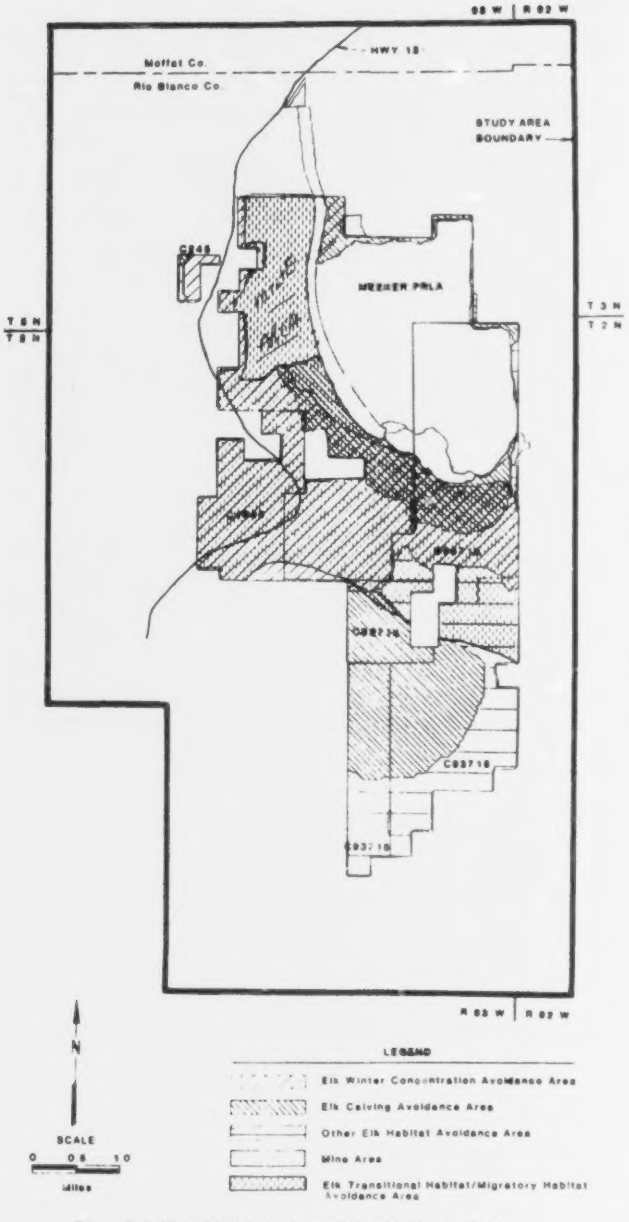

93 W
R 92 W
HWY 13
Moffat Co.
Rio Blanco Co.
STUDY AREA
BOUNDARY
MEEKER PRLA
T 3 N
T 2 N
T 3 N
T 2 N
C93716
C93716
R 93 W
R 92 W
N
SCALE
0
0.5
1.0
Miles
LEGEND
Elk Winter Concentration Avoidance Area
Elk Calving Avoidance Area
Other Elk Habitat Avoidance Area
Mine Area
Elk Transitional Habitat/Migratory Habitat Avoidance Area

Figure 3-1 Impact Avoidance Areas Within the Meeker PRLA and Federal Coal Leases held by Consol.

Table 3-1 ACREAGES OF SEASONAL ELK USE AREAS AVOIDED THROUGH MINE PLANNING AT THE MEEKER FEDERAL COAL LEASES

Leases	Elk Winter Concentration Areas (ac)	Elk Calving Areas (ac)	Other Elk Features (ac)	Elk Migratory/ Habitat (ac) Transitional
PRLA Boundary	1,653.0	864.0	4.0	2,641.0
C93713	821.0	471.0	185.0	917.0
C93714	41.0	408.0	112.0	129.0
C93715	0.0	410.0	338.0	---
C93716	20.0	850.0	1,225.0	---
Lease 245	98.0	10.0	11.0	443.0
C1546	1,111.0	19.0	0.0	985.0
TOTAL	3,744.0	3,032.0	1,875.0	5,115.0

Table 3-2 ANNUAL AND CUMULATIVE SURFACE MINING IMPACTS TO ELK WINTER CONCENTRATION AREAS AND ELK CALVING AREAS AT THE MEEKER PRLA

Mining Features	Elk Winter Concentration Area (ac)	Buffered Annual Cum. Total Winter Conc. Area (ac)	Elk Calving Area (ac)	Buffered Annual Cum. Total Calving Area (ac)
TRANSPORTATION CORRIDOR	160.00		281.00	
TRANS. CORR. & BUFFER ZONE	266.00		489.00	
SURFACE FACILITY 1 (NORTH)	.00		32.00	
SUR.FAC 1 & BUFFER ZONE	105.00		360.00	
SURFACE FACILITY 2 (SOUTH)	.00		14.00	
SUR.FAC 2 & BUFFER ZONE	.00		294.00	
TOPSOIL STOCKPILE 1 (EAST)	.00		6.00	
TOPSOIL 1 & BUFFER ZONE	.00		19.00	
TOPSOIL STOCKPILE 2 (WEST)	.00		17.00	
TOPSOIL 2 & BUFFER ZONE	.00		43.00	
LOADOUT FACILITY	26.00		.00	
LOADOUT & BUFFER ZONE	116.00		.00	
OVERBURDEN STOCKPILE	.00		194.00	
OB STOCKPILE & BUFFER ZONE	21.00		290.00	
MINING DISTURBANCE YEAR 1	.00		221.00	
MD 1 & BUFFER ZONE	.00	460.00	385.00	1707.00
MINING DISTURBANCE YEAR 2	.00		107.00	
MD 2 & BUFFER ZONE	.00	460.00	163.00	1706.00
MINING DISTURBANCE YEAR 3	.00		90.00	
MD 3 & BUFFER ZONE	.00	460.00	128.00	1778.00
MD YEAR 4 (SOUTHERN)	.00		60.00	
MD 4 & BUFFER ZONE	2.00	462.00	91.00	1831.00
MD YEAR 4 (NORTHERN)	.00		122.00	
MD 4B & BUFFER ZONE	.00	460.00	243.00	2043.00
MINING DISTURBANCE YEAR 5	.00		182.00	
MD 5 & BUFFER ZONE	.00	460.00	310.00	2232.00
MINING DISTURBANCE YEAR 6	.00		113.00	
MD 6 & BUFFER ZONE	.00	460.00	251.00	1455.00
MINING DISTURBANCE YEAR 7	.00		101.00	
MD 7 & BUFFER ZONE	.00	460.00	251.00	2468.00
MINING DISTURBANCE YEAR 8	.00		96.00	
MD 8 & BUFFER ZONE	.00	460.00	253.00	2571.00
MINING DISTURBANCE YEAR 9	.00		100.00	

Table 3-2 ANNUAL AND CUMULATIVE SURFACE MINING IMPACTS TO ELK WINTER CONCENTRATION AREAS AND ELK CALVING AREAS AT THE MEEKER PRLA (continued)

Mining Features	Elk Winter Concentration Area (ac)	Buffered Annual Cum. Total Winter Conc. Area (ac)	Elk Calving Area (ac)	Buffered Annual Cum. Total Calving Area (ac)
MD 9 & BUFFER ZONE	.00	460.00	251.00	2665.00
MINING DISTURBANCE YEAR 10	.00		115.00	
MD 10 & BUFFER ZONE	.00	460.00	259.00	2773.00
MINING DISTURBANCE YEAR 11	.00		142.00	
MD 11 & BUFFER ZONE	.00	460.00	278.00	2907.00
MINING DISTURBANCE YEAR 12	.00		146.00	
MD 12 & BUFFER ZONE	.00	460.00	292.00	3063.00
MINING DISTURBANCE YEAR 13	.00		205.00	
MD 13 & BUFFER ZONE	.00	460.00	357.00	3274.00
MINING DISTURBANCE YEAR 14	.00		180.00	
MD 14 & BUFFER ZONE	.00	460.00	323.00	3445.00
MINING DISTURBANCE YEAR 15	.00		106.00	
MD 15 & BUFFER ZONE	.00	460.00	229.00	3531.00
MINING DISTURBANCE YEAR 16	.00		81.00	
MD 16 & BUFFER ZONE	.00	460.00	210.00	3618.00
MINING DISTURBANCE YEAR 17	.00		84.00	
MD 17 & BUFFER ZONE	.00	460.00	221.00	3710.00
MINING DISTURBANCE YEAR 18	.00		74.00	
MD 18 & BUFFER ZONE	.00	460.00	206.00	3779.00
MINING DISTURBANCE YEAR 19	.00		146.00	
MD 19 & BUFFER ZONE	.00	460.00	212.00	3859.00
MINING DISTURBANCE YEAR 20	.00		49.00	
MD 20 & BUFFER ZONE	.00	460.00	115.00	3908.00
MD YEAR 21 (WESTERN)	.00		33.00	
MD 21 & BUFFER ZONE	.00	460.00	81.00	3923.00
MD YEAR 21B (EASTERN)	.00		25.00	
MD 21B & BUFFER ZONE	.00	460.00	86.00	3961.00
MD YEAR 22 (WESTERN)	.00		11.00	
MD 22 & BUFFER ZONE	.00	460.00	33.00	3933.00
MD YEAR 22B (EASTERN)	.00		16.00	
MD 22B & BUFFER ZONE	.00	460.00	78.00	3989.00
MD YEAR 23 (WESTERN)	.00		17.00	
MD 23 & BUFFER ZONE	.00	460.00	152.00	4079.00

Table 3-2 ANNUAL AND CUMULATIVE SURFACE MINING IMPACTS TO ELK WINTER CONCENTRATION AREAS AND ELK CALVING AREAS AT THE MEEKER PRLA (concluded)

Mining Features	Elk Winter Concentration Area (ac)	Buffered Annual Cum. Total Winter Conc. Area (ac)	Elk Calving Area (ac)	Buffered Annual Cum. Total Calving Area (ac)
MD YEAR 23B (EASTERN)	.00		5.00	
MD 23B & BUFFER ZONE	.00	460.00	35.00	3979.00
MD YEAR 23C (FAR WEST)	74.00		11.00	
MD 23C & BUFFER ZONE	190.00	650.00	51.00	4000.00
MINING DISTURBANCE YEAR 24	55.00		46.00	
MD 24 & BUFFER ZONE	132.00	666.00	120.00	4080.00
MINING DISTURBANCE YEAR 25	93.00		137.00	
MD 25 & BUFFER ZONE	208.00	797.00	238.00	4244.00
MINING DISTURBANCE YEAR 26	74.00		77.00	
MD 26 & BUFFER ZONE	144.00	826.00	173.00	4316.00
MINING DISTURBANCE YEAR 27	57.00		88.00	
MD 27 & BUFFER ZONE	110.00	866.00	168.00	4388.00
MINING DISTURBANCE YEAR 28	47.00		77.00	
MD 28 & BUFFER ZONE	98.00	911.00	133.00	4441.00
MINING DISTURBANCE YEAR 29	53.00		41.00	
MD 29 & BUFFER ZONE	121.00	981.00	89.00	4474.00
MINING DISTURBANCE YEAR 30	10.00		103.00	
MD 30 & BUFFER ZONE	47.00	960.00	137.00	4563.00
MAXIMUM CUMULATIVE (BUFFERED) IMPACTS		1226.00		4750.00

pit. While replacement requirements for winter concentration areas remain modest (< 500 acres) through year 22 of scheduled mining disturbance, elk calving habitat replacement needs increase in linear fashion with mining surface disturbance.

The accumulative habitat replacement needs for winter concentration areas and elk calving habitat were determined to be 1,226 acres and 4,750 acres, respectively, including acreages of buffer zones (Section 2.2) established for impacted areas. To address these needs, Consol has committed to purchasing or leasing lands in sufficient quantity to mitigate mining impacts on a schedule which anticipates actual surface disturbance. The ratio of acres impacted to acres enhanced will vary based on site-specific characteristics of vegetation, range condition, and patterns of elk use. As a basis for mitigation planning (including land acquisition and estimation of mitigation costs), an acre for acre replacement ratio for impacted elk habitat has been assumed . Off-site compensatory enhancement treatments will be interspersed throughout extensive areas to preclude artificial concentration of elk in response to treatments. Candidate areas for this off-site compensatory habitat enhancement (selected as described in Section 2.3.2) are identified in Figure 3-2. The extent of existing seasonal elk use within each of the primary candidate areas depicted in Figure 3-2 is summarized in Table 3-3. Review of this information indicates that based on the existing regional distribution of elk (developed from results of baseline study), an ample supply of winter concentration area exists within the immediate vicinity of the PRLA to meet off-site habitat enhancement (replacement) needs. Likewise, it appears that off-site enhancement needs (Table 3-2) for calving habitat can be met by the supply of existing off-site calving areas. It should also be noted that on-site enhancement of calving and winter ranges, prior to mining, is also feasible based on Consol's Mine Plan (Section 4), and could be employed to temporarily compensate for habitat loss.

Site-specific commitments regarding the sequence and nature of habitat enhancement treatments within these candidate areas is not possible at this time due to the mosaic of federal and private properties involved. Information presented in Table 3-4 indicates that mountain shrubland and sagebrush shrublands predominate on winter range improvement sites. Literature review indicates that these vegetation communities can be expected to respond to burning, fertilization, and a variety of mechanical treatments in a matter beneficial to wintering elk (Section 2.3.2.2). Following an inventory of baseline cover, production, and condition of shrubland stands within these candidate areas selected for off-site winter

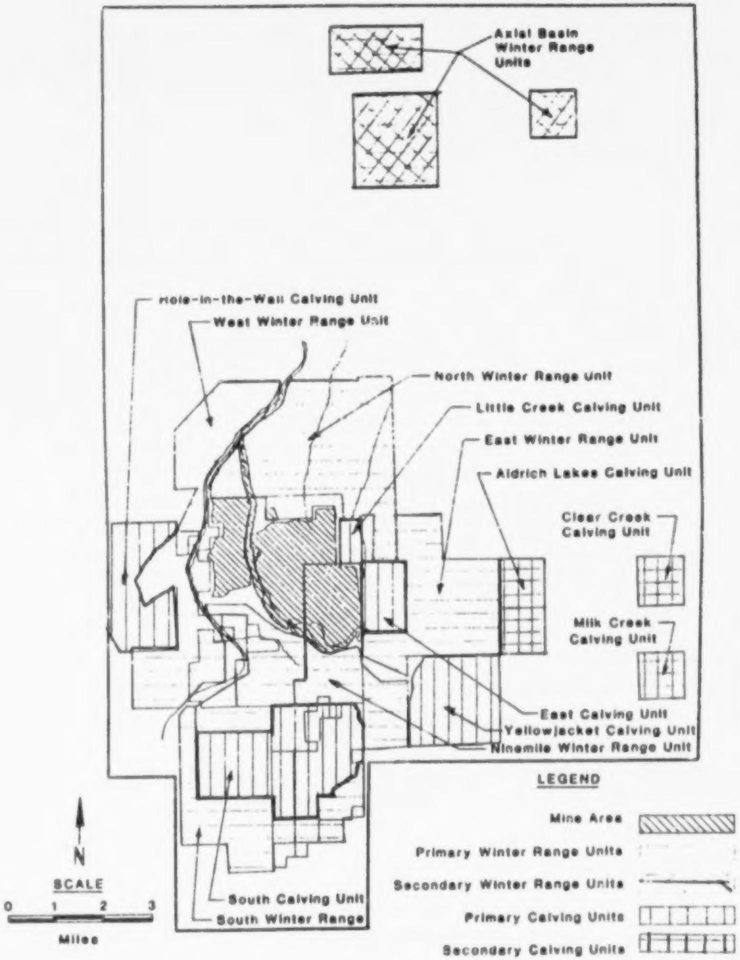

Axial Basin Winter Range Units
Hole-in-the-Wall Calving Unit
West Winter Range Unit
North Winter Range Unit
Little Creek Calving Unit
East Winter Range Unit
Aldrich Lakes Calving Unit
Clear Creek Calving Unit
Milk Creek Calving Unit
East Calving Unit
Yellowjacket Calving Unit
Ninemile Winter Range Unit
South Calving Unit
South Winter Range
N
SCALE
0 1 2 3
Miles
LEGEND
Mine Area
Primary Winter Range Units
Secondary Winter Range Units
Primary Calving Units
Secondary Calving Units

Figure 3-2 Locations of Primary and Secondary Off-Site Calving and Winter Range Habitat Enhancement Areas in Relation to Potential Mining Disturbance at the Meeker PRLA.

Table 3-3 ACRES OF EXISTING SEASONAL ELK RANGES WITHIN PRIMARY AND SECONDARY OFF-SITE HABITAT IMPROVEMENT AREAS

Habitat Improvement Sites	Elk Winter Conc. Areas (ac)	Elk Severe Winter Range (ac)	Elk Calving Areas (ac)	Other Elk Features (ac)	Total Acreage
PRIMARY					
North Winter Range Unit	1686.0	0.0	253.0	3847.0	5786.0
South Winter Range Unit	376.0	505.0	102.0	2120.0	3103.0
Ninemile Winter Range Unit	3361.0	0.0	1009.0	695.0	4451.0
West Winter Range Unit	2848.0	0.0	621.0	1229.0	4698.0
East Winter Range Unit	0.0	0.0	0.0	3743.0	3743.0
Hole in the Wall Calving Unit	13.0	0.0	2694.0	570.0	2696.0
South Calving Unit	253.0	0.0	3121.0	779.0	4154.0
East Calving Unit	0.0	0.0	24.0	903.0	927.0
Yellow Jacket Calving Unit				2360.0	2360.0
Little Creek Calving Unit				309.0	309.0
TOTALS	8537.0	505.0	7824.0	16555.0	32227.0

Table 3-3 ACRES OF EXISTING SEASONAL ELK RANGES WITHIN PRIMARY AND SECONDARY OFF-SITE HABITAT IMPROVEMENT AREAS (concluded)

Habitat Improvement Sites	Elk Winter Conc. Areas (ac)	Elk Severe Winter Range (ac)	Elk Calving Areas (ac)	Other Elk Features (ac)	Total Acreage
SECONDARY HABITAT IMPROVEMENT SITES					
Aldrich Lakes Calving Unit				1325.0	1325.0
Clear Creek Calving Unit				685.0	685.0
Mill Creek Calving Unit				642.0	642.0
Axial Basin Winter Range Unit				4280.0	4280.0
TOTAL				6932.0	6932.0

Table 3-4 EXTENT OF EXISTING VEGETATION ON PRIMARY OFF-SITE HABITAT IMPROVEMENT AREAS WITHIN THE INTENSIVE STUDY AREA

Habitat Improvement Areas	Mountain Shrub (ac)	Sage-brush (ac)	Aspen (ac)	Wetlands (ac)	Douglas Fir (ac)	Bunch Grass (ac)	Pinyon Juniper (ac)	Baresoil (ac)	Mountain Grasslands (ac)	Totals[a] All Types (ac)
North Winter Range Unit	4051.0	731.0	78.0	30.0	0.0	8.0	0.0	0.0	3.0	5786.0
South Winter Range Unit	2230.0	431.0	130.0	64.0	0.0	0.0	191.0	0.0	0.0	3102.0
Ninemile Winter Range Unit	2765.0	1275.0	66.0	76.0	0.0	66.0	0.0	0.0	0.0	4451.0
West Winter Range Unit	3513.0	540.0	169.0	23.0	0.0	21.0	0.0	0.0	0.0	4608.0
East Winter Range Unit	231.0	12.0	49.0	1.0	0.0	0.0	0.0	0.0	11.0	3743.0
Hole in the Wall Calving Unit	1231.0	76.0	850.0	20.0	7.0	1.0	0.0	0.0	20.0	2696.0
South Calving Unit	2832.0	548.0	205.0	171.0	0.0	0.0	0.0	0.0	0.0	4154.0
East Calving Unit	294.0	48.0	545.0	2.0	6.0	0.0	0.0	0.0	51.0	927.0
Little Creek Calving Unit	140.0	8.0	152.0	3.0	0.0	2.0	0.0	0.0	9.0	309.0
Yellow Jacket[a] Calving Unit										2360.0
TOTAL	17287.0	3669.0	2544.0	390.0	13.0	98.0	191.0	0.0	94.0	

[a] Vegetation mapping incomplete for these areas, acreages include area within their units outside the intensive study area.

range mitigation efforts, specific treatments (derived from techniques described in Section 2.3.2) and schedules for their application will be identified. Scheduling of these treatments to provide maximum beneficial range responses in step with anticipated compensatory off-site habitat enhancement needs (Table 3-2) is envisioned. For some areas and treatments (e.g., fertilization), a rotational pattern of range enhancement treatment may be appropriate. Mountain shrub and aspen predominate on candidate areas selected for calving habitat enhancement (Table 3-4). Purchase or lease of these areas will be followed by selection of appropriate habitat enhancement treatments, based on inventory of existing range conditions and anticipated needs or calving habitat replacement (Table 3-2). Aspen stands on these areas will be managed to insure longevity in order to provide thermal cover throughout the course of habitat enhancement efforts. Appropriate methods for off-site enhancement of mountain shrubland, sagebrush shrubland, and meadow (wetland) vegetation stands will be identified based on a rotational pattern of treatments including fall burning, fall range fertilization, and release of grazing pressure.

Regional experts in the areas of fire and range ecology will be consulted in selection of treatments. Scheduling and application of all off-site habitat enhancement treatments will be coordinated with CDOW, Colorado MLRD, and BLM.

Fencing of primary roadways (Highway 13 and the Coal Creek Road) and construction of highway underpasses in areas identified as primary elk crossings (based on results of on-going studies and consultation with CDOW and the Colorado Department of Highways) will be completed to mitigate increased mortality which may occur as a result of development at the Meeker PRLA.

Public hunting opportunities lost as a result of mine development (assuming CDOW maintains surface control of the Jensen State Wildlife Area) will be mitigated through an offsetting increase in public access to areas obtained by Consol for purposes of off-site compensatory mitigation. Consol will work with CDOW to develop access arrangements for these areas.

Consol will work with CDOW to develop an employee program to inform workers of Colorado Statutes regarding taking of fish and game and specific mitigation measures (including firearms and activity restrictions) developed to prevent illegal harvest at the PRLA. In addition, an incentive program will be developed by Consol to encourage compliance with these statutes and mitigation restrictions and cooperation with CDOW in apprehending offenders.

3.3 RECLAMATION COMMITMENTS

Information presented in this section describes resources and technology proposed for use in reclaiming mined and otherwise disturbed areas. Specific elements of the reclamation process are described, including appropriate alternative technologies, which permit projection of reclamation success within a conservative timeframe. This information demonstrates that reclamation practices can (over time) offset effects of mining through replacement and enhancement of habitat features which are important to elk.

3.3.1 Reclamation Site Plan

Topsoil redistribution and management will be directed toward reestablishment of functional relationships between soil depth and vegetation characteristics. Based on observation of soil profiles within the PRLA, minimum depths of 2 ft for aspen stands, 18 in. for shrubland mosaic communities, and 12 in. for grassland areas would provide functional soil resources similar to resources presently utilized by indigenous vegetation. Techniques for maintenance of the biotic properties of soils, described in Section 3.3.2, will be applied to the extent feasible to sustain productivity and the "seed bank" or reservoir of seeds and other plant parts which are capable of growth or regeneration. Location of soil stock piles are identified in Section 4.0; the pattern of soil depth will be determined by vegetation pattern.

Land forms which characterize the Meeker coal leases and surrounding landscape include narrow valley bottoms; steep, relatively linear south-facing slopes; less steeply angled, longer, and curvilinear north-facing slopes; swales; and ridges. Each of these land form elements would be restored in the post-mining landscape of the coal leases.

Post-mining topography has been developed to enhance characteristics of areas designed for elk calving and rearing (generally north- and east-facing slopes in close proximity to south-facing slopes) while sustaining or expanding the extent of south and west facing slopes which would be suitable for development as winter range or transitional range. Concomitantly, topographic features adjacent to the mine will be carried into or through the post-mining landscape and will restore the location of designed elk use areas relative to surrounding use areas. Proposed topographic features are illustrated in Figure 3-2.

At a finer scale of topographic relief, slope surfaces will be shaped to produce a system of convex and concave surfaces prior to redress of topsoil. Shaping would provide topographic escape cover for elk. As practiced at the Trapper Mine near Craig, Colorado, slope shaping is performed by dozers working along elevational contours to produce broad swales interconnected downslope with other swales, water impoundments, and larger drainage features.

North-facing slopes designated for calving/rearing use would include nearly level terrace or bench surfaces intended to serve as feeding or bedding areas. Such features would also serve surface water and erosion control needs particularly during earlier phases of vegetation establishment.

The proposed post-mining contours have been developed with reference to the overburden volume anticipated, slope stability requirements, and limits of overburden and soil handling equipment. Overall relief and topographic variation is anticipated to increase small scale environmental variation and thereby enhance plant as well as wildlife species diversity achievable within the post-mining landscape.

Open water is recognized as an important element of habitats used by elk during the late spring to early summer calving/rearing period. To supply water, runoff from spring snowmelt will be captured in small impoundments along each of the tributary branches of James, Little, and Elkhorn creeks. Impoundments will be located in proximity to aspen, Gambel oak, and other shrubland stands designed for calving season and transitional season use.

Siting of individual impoundments will also be predicated on the optimal locations for collection of both surface water runoff and ground water discharge. As such, it is anticipated that ponds will be situated in the

lower reaches of drainages within the elk calving/rearing areas. The majority of recharge to these ponds will occur via snowmelt during spring months. Establishment of tree and shrubland stands on north-facing slopes will enhance the accumulation of snow during winter, and therefore, increase yields during snowmelt periods.

Existing data indicate that the post-mining backfill areas should be characterized as a single, unconfined ground water system. The eventual piezometric levels which become re-established in the backfill cannot be determined at this time. It is likely, however, that the post-mining piezometric surface will be a reflection of surficial topography, with a slight ground water gradient towards topographically low areas. This would allow for some ground water discharge along valley bottoms. Such discharge would, then, also be a source of water for impoundment storage, particularly during spring months. Ground water discharge would be expected to diminish significantly during the early summer months (June, July). The quality, quantity, and duration of ground water flow will depend on specific backfill characteristics and on the lithologic and structural conditions of undisturbed strata. It is anticipated that the stratigraphic dip on the north and east sides of the James Creek valley will facilitate ground water discharge.

As noted, optimal pond locations occur in the lower reaches of tributaries to James, Elkhorn and Little Creeks. To provide water for elk in topographically higher sectors, a series of smaller impoundments will be constructed in the headwater areas of each drainage. In this manner, early spring runoff could be captured in both upper and lower stream reaches, enhancing storage of runoff.

Vegetation

Over the life of the mine, vegetation would be removed from an area of approximately 5,200 acres including surface facilities, transportation corridors, a loadout, soil and overburden storage, and two pit extraction areas. Vegetation which would be affected by mining includes a mosaic of shrublands dominated by serviceberry (*Amelanchier utahensis*), snowberry

(Symphoricarpos oreophilus), Gambel oak (Quercus gambelii), and sagebrush (Artemisia tridentata) which comprises 73 percent of the area. Aspen (Populus tremuloides) stands, mixed on their margins with tall shrubs, comprise approximately 1,150 acres or 22 percent of the mine area. Montane grasslands on ridges and alluvial fans, and a system of meadows and wetlands along James Creek and its tributary branches are also present. The pattern and relative abundance of vegetation at the site (Figure 3-3) are reproduced in the revegetation plan (Figure 3-5) in relationship to topographic features and the micro-climatic variation imposed by topography.

The revegetation plan provides for approximately the same areal extent of each vegetation type as that prior to mining. However, the configurations and character of proposed vegetation would provide enhanced forage production and availability on winter range and a pattern of resource availability (water, gentle topography, forage, and hiding cover) in calving areas which would resemble conditions evident in the most intensively used calving areas of the region.

The extensive shrublands of the reclaimed site are envisioned as relatively open areas dominated by caespitose and rhizomatous native grasses, legumes, and herbaceous plants in combination with shrubs less than 3 feet tall (rose, snowberry, sagebrush). Taller shrubs (oak, serviceberry) would be located on slope features most favorable for establishment and growth: swales, leeward slopes, pond margins, and drainage control features. The taller shrub aggregations would be linear to oblong in outline and of adequate width to provide hiding (escape) cover from points of view outside of the shrub stands.

Functional hiding cover, with shrubs in excess of 6.5 feet in height, is anticipated to develop over a period of 10 to 15 years primarily within the 20 to 25 percent of the area where transplants and shrub plantings are concentrated. Tall shrubs may develop in the remaining area over a substantially longer period governed by climatic episodes, actual land use, and other factors which will affect the reproductive success and establishment of each species.

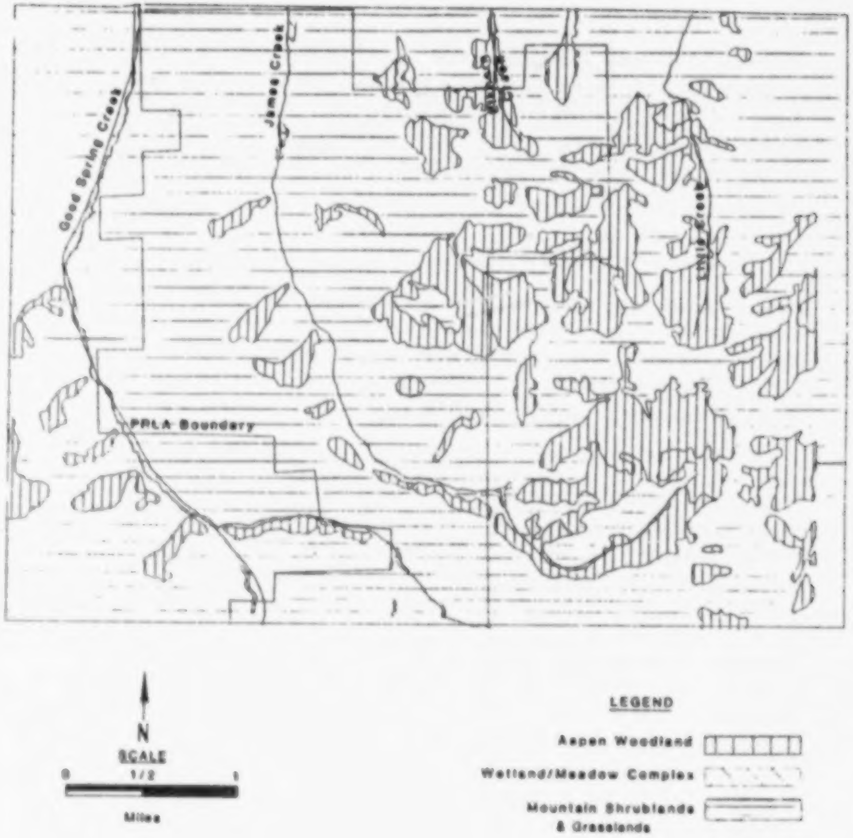
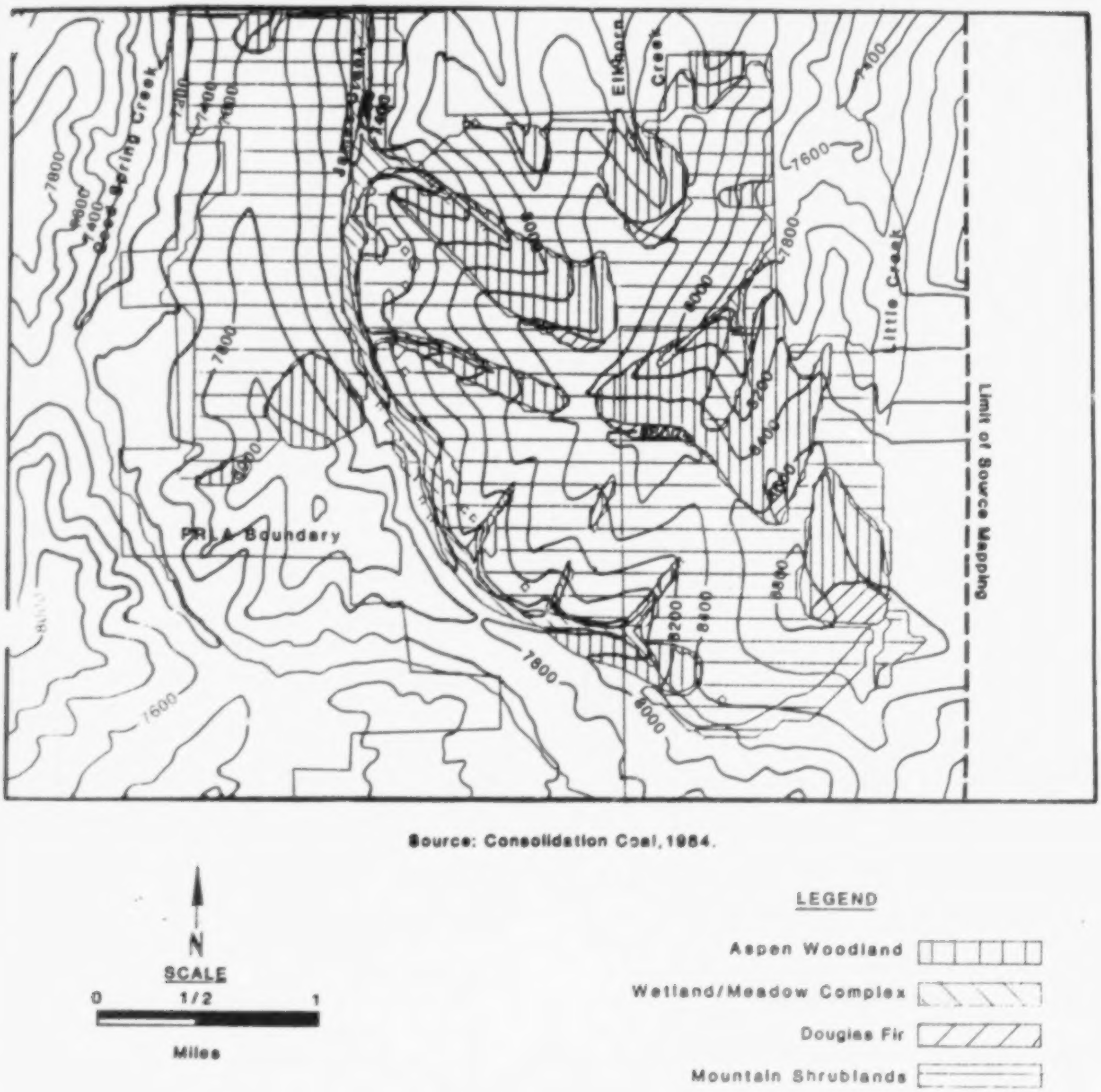


Figure 3-3 Pre-mining Vegetation, Meeker Coal Leases.


Good Spring Creek
Jensen Creek
Elkhorn Creek
Little Creek
PRLA Boundary
Limit of Source Mapping
7200
7400
7600
7800
8000
8200
8400
N
SCALE
0
1/2
1
Miles
LEGEND
Aspen Woodland
Wetland/Meadow Complex
Douglas Fir
Mountain Shrublands

Source: Consolidation Coal, 1984.

Figure 3-4 Reclaimed Surface Topography.

Figure 3-5 Revegetation Plan, Meeker Coal Leases.

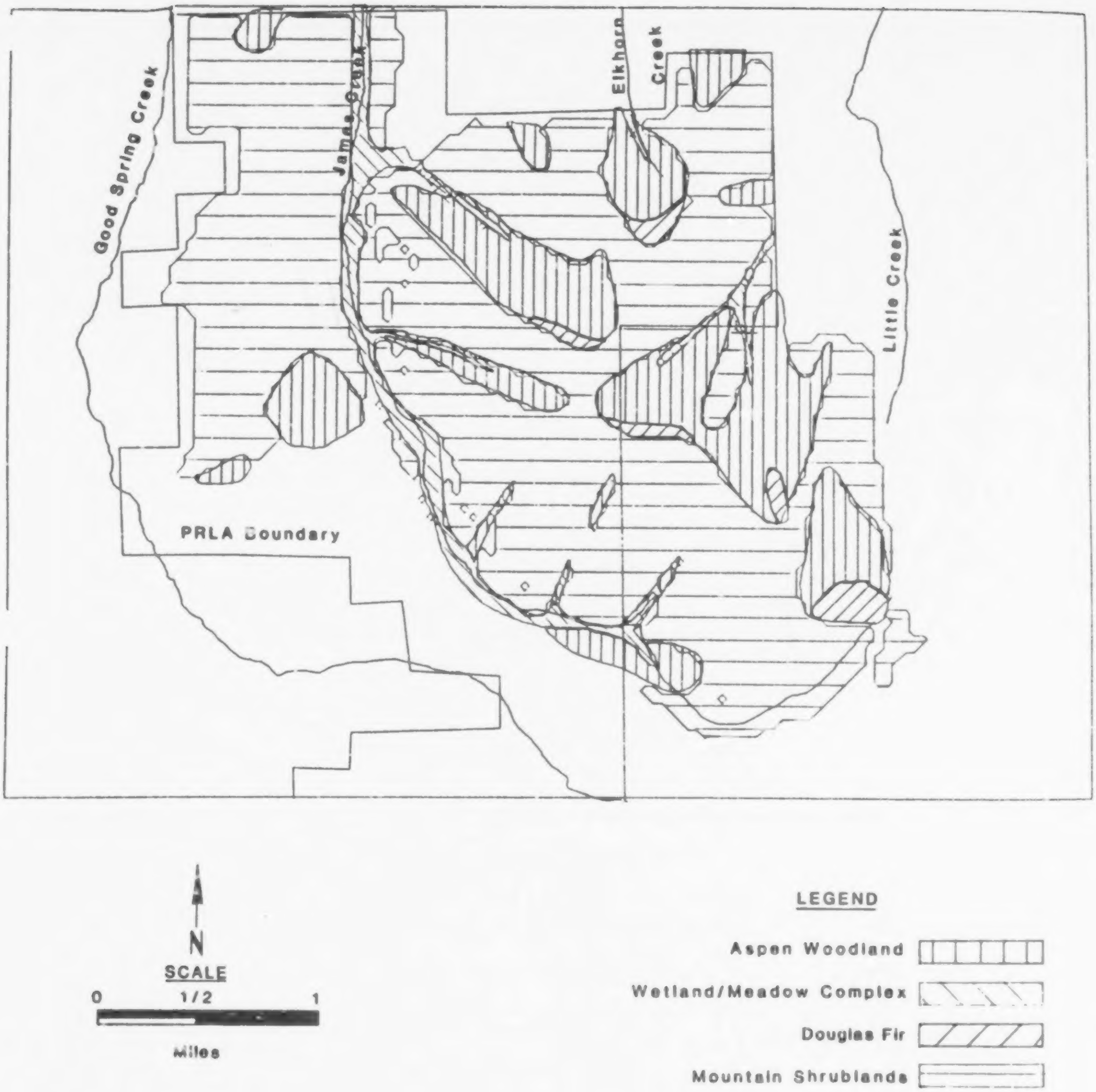

Good Spring Creek
James Creek
Elkhorn Creek
Little Creek
PRLA Boundary
N
SCALE
0
1/2
1
Miles
LEGEND
Aspen Woodland
Wetland/Meadow Complex
Douglas Fir
Mountain Shrublands

Figure 3-5 Revegetation Plan, Meeker Coal Leases.

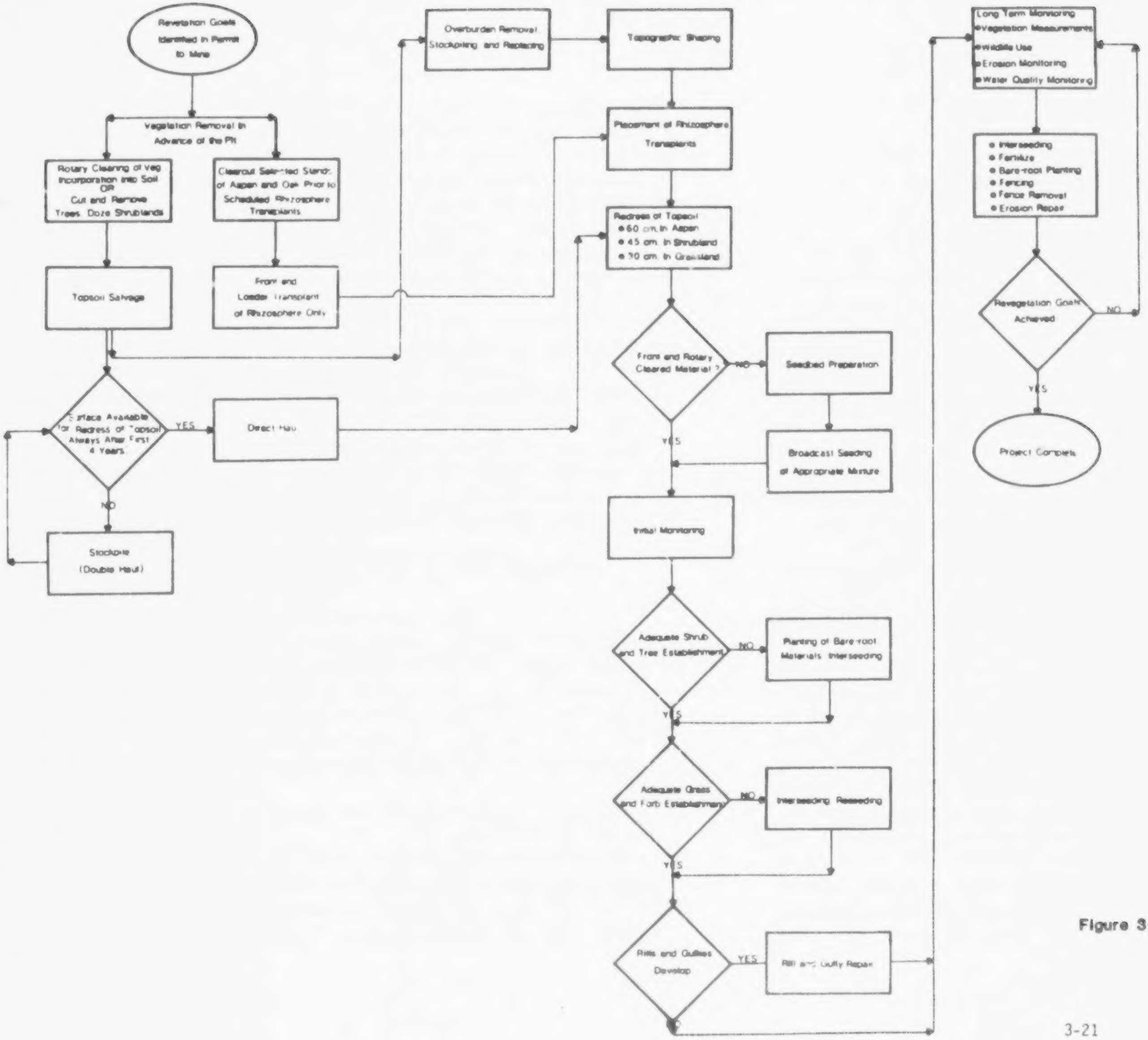

Revetation Goals Identified in Permit to Mine
Vegetation Removal in Advance of the Pit
Rotary Clearing of Veg Incorporation into Soil OR Cut and Remove Trees. Doze Shrublands
Clearcut Selected Stands of Aspen and Oak Prior to Scheduled Rhizosphere Transplants
Topsoil Salvage
Front end Loader Transplant of Rhizosphere Only
Surface Available for Redress of Topsoil Always After First 4 Years
YES
NO
Direct Haul
Stockpile (Double Haul)
Overburden Removal Stockpiling and Replacing
Topographic Shaping
Placement of Rhizosphere Transplants
Redress of Topsoil
● 60 cm. in Aspen
● 45 cm. in Shrubland
● 30 cm. in Grassland
Front end Rotary Cleared Material ?
NO
YES
Seedbed Preparation
Broadcast Seeding of Appropriate Mixture
Initial Monitoring
Adequate Shrub and Tree Establishment
NO
YES
Planting of Bare-root Materials Interseeding
Adequate Grass and Forb Establishment
NO
YES
Interseeding Reseeding
Rills and Gullies Develop
YES
Rill and Gully Repair
Long Term Monitoring
● Vegetation Measurements
● Wildlife Use
● Erosion Monitoring
● Water Quality Monitoring
● Interseeding
● Fertilize
● Bare-root Planting
● Fencing
● Fence Removal
● Erosion Repair
Revegetation Goals Achieved
NO
YES
Project Complete

Figure 3-6 Revegetation Process.

CDM
environmental engineers, scientists, planners, & management consultants

Aspen regeneration areas would be initially composed of evenly spaced groups of trees which would be managed to encourage rapid expansion of cover and toward canopy cover and hiding cover characteristics similar to existing stands. Appropriate management techniques are described by Perala (1977). Shrub plantings at the margins of aspen stands would be used to increase hiding cover as viewed from outside of aspen stands.

Meadow and wetland areas would be developed primarily along the valley bottom of James Creek and along larger tributary drainages of Little and Elkhorn creeks. Impoundments would provide small open water habitats which would be surrounded by emergent semi-aquatic vegetation and stands of willows (Salix caudata) and cottonwood (Populus deltoides). Gently sloping valley bottoms would be planted primarily with rhizomatous native grasses resistant to erosion and tolerant of occasional flooding.

3.3.2 Proposed Revegetation Procedures and Technological Alternatives

To achieve revegetation goals throughout the coal lease areas affected by mining, procedures to establish a self-sustaining vegetation cover would be integrated with mine operations as indicated in Figure 3-6. Coordination is particularly essential to complete vegetation removal and transplant work not only prior to topsoil salvage and overburden removal, but during a season most favorable for transplant success (autumn). Each of the proposed revegetation procedures identified in Figure 3-4 has been successfully employed, at a similar scale, by mine reclamation personnel in northwest Colorado.

Transplant of root zone material (the rhizosphere), after removal of above-ground stems and trunks, is suggested in place of attempts to transplant entire mature trees and shrubs. This modification of the front-end loader transplant technique may enhance survival and stimulate aspen and oak stem regeneration from adventitious buds of roots. Research results indicate that transplant survival of larger materials is inferior to the survival of smaller species and individuals (Carlson 1981), whereas clear cutting stimulates development of stems from roots (Schier and Smith 1979).

Shrub and tree establishment are recognized as the most difficult revegetation goals pertinent to the coal leases. Four separate approaches would be employed as necessary to assure establishment of trees and shrubs. These include direct transplant, seeding, planting of bare root materials, and special topsoil management. Topsoil handling would include an avoidance of topsoil storage and rotary clearing of vegetation and soil material to enhance regeneration from underground plant parts and from native seed resources transported with salvaged soil to the reclaimed surface. Young plants would be protected from wildlife by fencing where necessary. Additional sapling establishment would be promoted in aspen stands by shearing and other management techniques described in the silvicultural literature (Olson and Lundgren 1978; Perala 1977). Creation of Douglas-fir stands would be approached primarily through planting of bare root seedlings in favorable areas.

Alternative site preparation approaches performed prior to topsoil salvage include rotary clearing (noted earlier as a means of enhancing regeneration of plants from plant parts and seed resident in the soil) and more customary clear-cutting and scraping. Initial results at the Foidel Creek Mine south of Steamboat Springs, Colorado, suggest that rotary clearing may enhance results as well as cost-effectiveness in relationship to typical clearing. Apparent advantages include a simplified clearing procedure, enhanced organic matter content of soils, decreased bulk density, and incorporation of indigenous seed sources. Ongoing research is expected to further confirm the viability of this technique which employs equipment modified from that which is used to grind asphalt roadways (Johnson 1983).

As outlined in Figure 3-6, verification and monitoring of revegetation success would trigger remedial technologies as applicable to the extent and character of particular shortfalls. Additional plantings, interseeding, or reseeding may be needed as a result of unpredictable climatic events. Monitoring will detect erosion features and enable their repair to prevent further soil loss or degradation of vegetation.

3.4 MONITORING COMMITMENTS

Consol recognizes regulatory mandates for monitoring of the effectiveness and adequacy of committed mitigation discussed in Section 3.1 through 3.3, including Council on Environmental Quality (CEQ) Regulations (40 CFR 1505.2-3), Department of the Interior (DOI) and BLM guidelines and policy statements including 516DM.3 (D)(4) and BLM Information Memorandum No. 82-169. Based on these regulations, guidelines and policy, and recommendations presented in Section 2.4 of this report, Consol has incorporated monitoring of elk responses to mining, reclamation, and off-site enhancement as a committed mitigation measure. The nature of monitoring goals and objectives identified in Section 2.4 dictates a need for long-term intensive monitoring employing state-of-the-art technology. In accordance with guidance provided by BLM's Colorado Environmental Handbook (BLM 1983), monitoring commitments presented here will address the following details:

- o Objectives of committed monitoring activities and conceptual approaches to them.
- o Commitments of manpower to acheive monitoring objectives.
- o Commitments of minimum levels of monitoring effort.
- o Identification of costs of this monitoring and commitment to fund these efforts.

Additional details including sampling plans, refined estimates of levels of field effort, and data analysis techniques (which are beyond the scope of this report) will be developed following a leasing decision for the Meeker PRLA.,

3.4.1 Objectives and Approaches to Monitoring

Consol's commitments for monitoring at the PRLA address five principal topics discussed in Section 2.3.4:

1. Behavioral and reproductive reponse of elk to mining disturbance.

2. Behavioral and reproductive response of elk to off-site habitat enhancement treatments.
3. Response of vegetation to off-site habitat enhancement treatments.
4. Revegetation success including cover, production, diversity, erosion, and reestablishment of elk use.
5. Direct loss of elk to road kill and illegal harvest.

Commitments concerning conceptual approaches to each of these topics are presented in the sections which follow.

3.4.1.1 Monitoring of Elk Response to Mining

Long-term changes in elk distribution and range use in response to mining disturbance will be monitored by means of an on-going program of elk capture and telemetry monitoring. Recapture of radio-collared elk will be conducted as necessary to restore transmitters (prior to battery failure) and to provide a long-term history of changes in home range location, size, and habitat characteristics in response to mining disturbance. Cow elk will be located with the aid of radio-telemetry following the calving season to assess their annual reproductive performance. A variety of capture methods would be employed in coordination with the CDOW. Calf elk will also be captured, fitted with radio transmitters, and recaptured as necessary to monitor their survival and recruitment to the elk herd. This program will be conducted at the PRLA as well as control areas outside the influence of mining disturbance. Sample sizes necessary to test statistical significance of production, recruitment, and changes in home range characteristics will determine the number of elk which will be instrumented with radio transmitters. Presently, it is envisioned that 50-75 radio transmitters will be kept in service during the course of this program which will continue throughout the life of the mine.

3.4.1.2 Response of Elk and Vegetation to Off-Site Habitat Enhancement Treatments

Response of elk to habitat enhancement treatments will be monitored through comparison of levels of elk use at treatment versus control (no treatment) areas using a pellet group plot index to elk use. Radio-collared elk (Section 3.4.2) will be monitored at levels necessary to determine preferences for treatments or control areas. Home range shifts and patterns of elk use within them will be analyzed to assess the existence of any such preferences. This program will be conducted throughout the life of the mine.

3.4.1.3 Monitoring of Vegetation Responses to Off-Site Habitat Enhancement Treatments

Vegetation cover, production, diversity, and levels of erosion resulting from treatments will be monitored to detect significant differences in these parameters, between treatment and control areas. Forage quality responses to treatments will also be monitored through collection and laboratory analysis of vegetation. Parameters of forage quality to be monitored will be selected with the assistance of CDOW Big Game Researchers. The significant expertise and laboratory capabilities of CDOW's research staff will be utilized to the extent possible, including cooperative research efforts in the area of forage quality analysis. Sampling plans and methods of analysis will be selected based on sample adequacy requirements determined by statistical testing techniques. Monitoring of vegetation response to treatments will continue until the efficacy of habitat enhancement treatments is determined as a basis for adjustment of off-site habitat replacement commitments and schedule. At present, this monitoring program is envisioned to continue for a minimum of 10 years.

3.4.1.4 Monitoring of Revegetation Success

Monitoring of erosion features and vegetation characteristics (cover, annual production, woody plant stem density, and species diversity) are routinely required of mine operators under MLRD regulations. Quantitative vegetation goals are set for reclaimed areas based upon reference areas selected to represent each pre-mining vegetation type. One goal of long term vegetation monitoring is to establish the relationship between the reclaimed area and these official standards of success. Under MLRD

regulations, performance the 9th and 10th year subsequent to the last significant reclamation activity will provide criteria for reclamation bond release.

Intensive monitoring will be conducted at the Meeker PRLA during the initial seasons following the redress of topsoil and the planting or transplanting of materials to affect appropriate remedies and to establish the earliest possible date for the termination of revegetation activity. This initial monitoring and monitoring throughout the first 10 years subsequent to revegetation are routine at surface coal mines under MLRD regulations.

Additional long-term monitoring will be conducted at the Meeker coal leases to identify and document the achievement of habitat-based reclamation goals, particularly the establishment of vegetation providing escape cover and thermal cover as quantified by production, canopy cover, and horizontal line-of-sight measurements of the vegetation and quantitative measures of elk use. This information will provide a basis for ongoing evaluation of the need for habitat enhancement needs within the reclaimed area and at off site habitat enhancement areas. This monitoring program will continue throughout the life of the mine.

3.4.1.5 Monitoring of Road Kill and Illegal Harvest

Monitoring of elk losses resulting from road kill and poaching will be monitored in coordination with CDOW field staff. Results of this monitoring will be used as a basis for adjustments to mitigation efforts designed to minimize such losses (Section 2.3.4) including fencing and roadway underpasses. This program will continue throughout the life of the mine.

3.4.2 Manpower Commitments for Monitoring

To achieve objectives of monitoring commitments presented in Section 3.4.1, on-site staff requirements based on committed levels of effort were identified as follows:

1 Full-time Wildlife Biologist to act as Principal Investigator for wildlife monitoring efforts.

1 Part-time (seasonal) Wildlife Biologist to act as a Field Assistant to the Principal Investigator.

1 Full-time reclamation specialist to act as Principal Investigator for revegetation monitoring efforts.

2 Part-time (seasonal) biologists to act as Field Assistants to the Principal Investigator

Direct (salary) and indirect (benefits) costs of employing a staff of this size were incorporated in the economic analysis of the proposed mine at the Meeker PRLA.

3.4.3 Commitments of Minimum Levels of Effort for Monitoring Activities

As discussed in Section 3.4.1, sampling methods and data analysis procedures for this monitoring plan will be selected though consultation with statisticians and researchers working in areas addressed by monitoring objectives. Some sample methodologies will, in turn, depend upon characteristics of off-site habitat enhancement treatment areas (Section 3.2) selected in the final mitigation plan for the Meeker PRLA. Based on monitoring commitments presented here, the following durations for monitoring programs are envisioned:

Monitoring Program	Duration
Monitoring of Elk Response to Mining	Life of Mine
Monitoring of Elk Response to Off-Site Habitat Enhancement Treatments	Life of Mine
Monitoring of Vegetation Responses to Habitat Enhancement Treatments	10 Years (minimum)
Monitoring of Vegetation Success	Life of Mine (until Bond release)
Monitoring of Road Kill and Poaching Losses	Life of Mine

Levels of effort required to achieve the objectives of this monitoring program, in a manner consistent with scientifically acceptable standards for such research, are committed as part of the monitoring program for duration of each program as listed above.

3.4.4 Funding Commitments for Monitoring Efforts

Due to the duration of activities identified in this plan, costs of the monitoring program will be influenced by a number of variables which are readily apparent at this time. These include: sampling methodologies; inflation and resultant increases in the cost of salaries, goods, and subcontractor services; and the potential for modification of monitoring commitments based on results of these investigations. Based upon the scope and duration of monitoring commitments presented here, an average annual cost of $300,000 (1984 dollars) was identified as an appropriate level of financial commitment. The cost has been factored into mine operation costs for the Meeker PRLA.

APPENDIX E

REGIONAL ANALYSIS OF CULTURAL RESOURCES

APPENDIX E

REGIONAL ANALYSIS OF CULTURAL RESOURCES

The cultural resources record in the Danforth Hills is derived from inventories that have been conducted as the result of energy development over the past 10 years. The inventories range from small linear/block inventories for coal exploration to large block surveys conducted prior to lease development (table E-1).

The cultural resources that have been identified in the Danforth Hills range from Paleo-Indian period bison kill sites to historical homesteads. Although the cultural resources represent all the major time periods of human occupation in northwest Colorado, they generally represent a limited distribution and range of economic activities.

A general discussion of the cultural resources in northwest Colorado may be found in Grady (1984), Cassells (1983), and Athearn (1976). The former two sources discuss the basic outline of prehistoric cultures, and the latter source provides a history of northwest Colorado. In the Danforth Hills, the following references summarize the cultural resource data base: Arthur 1977, Henss and Anderson 1979, Jennings and Sullivan 1977, Kranzush 1982, Lischka 1975, Piontkowski, Schwartz and Meachan 1980.

The patterns of prehistoric and historical site location that emerge may be summarized as follows:

The majority of the Danforth Hills area is not conducive to site location, and cultural resources seem to be confined to small atypical areas.

Overall site density is low. One resource (sites and isolated finds) exists per 73 to 260 acres or one site per 114 to 1,560 acres.

The natural environment is quite lush. It provided prehistoric peoples with a wide diversity and high quantity of plant and animal food sources. However, the lush vegetation, high topographic variability and limited seasonal mobility and livability limited the use of the area.

For the reasons discussed above, historical occupation has been limited to seasonal livestock use and wildlife hunting.

The primary period of homesteading occurred from 1917-1930 and again in the late 1930s. (See table E-2 for cultural resources located in the Danforth Hills.)

Several factors influence locating cultural resources in the Danforth Hills. First, the lush, dense vegetation obscures much of the ground and limits mobility. Second, deposition of soils on slopes and along major streams seems to be on-going and extensive. Therefore, cultural resources are not as likely to be fully discovered in the area as in others, and disturbance of the surface may reveal many more sites than are evident on the surface.

Two cultural resources have been evaluated for inclusion on the National Register of Historic Places (36 CFR 60). The Thornburgh Battle site, a result of the battle that was fought between the U.S. Army and the Utes following the Meeker Massacre in 1879 at the White River Indian Agency near Meeker. The site is located in section 27, T. 3 N., R. 92 W., and is located some distance from the tract. The other site is not on the National Register but does qualify because of its uniqueness. The Somemore site (5MF969) is a bison kill site probably of the Paleo-Indian period. It is located in section 25, T. 4 N., R. 94 W., and is not near the tract. The other cultural resources have not been evaluated and therefore their status to the National Register is not known.

TABLE E-1
CULTURAL RESOURCE INVENTORIES IN THE DANFORTH HILLS

REFERENCE	*T.*	*R.*	*SECTION*	*FINDINGS*
Armstrong, Wignall, 1981	3	94	2-11, 14, 15, 17-22	3 prehistoric sites
	4	94	7-23, 26-34	5 isolated finds
Arthur, 1977	4, 5	87		
	6	89-91	Multiple	None in Danforth Hills
Babcock, 1982	3	93	19	None
Baker, Reed, 1978	3	93	19, 30	5 prehistoric sites
Brownfield, 1975b	3	93	7, 16	None
Brownfield, 1975c	3	93	26	None
Creasman, 1983c	3	94	34	None
Conner, 1977b	4	93	27, 34	None
Gordon, 1977	3	92	28	None
Gordon et al., 1982	2, 3, 4	92, 93, 94	Multiple	1 prehistoric site
Greer, 1980	4	92	22	None
Hansen, 1977a	3	94	23, 26	None
Hansen, 1977j	4	92	24	None
Hansen, 1977s	4	94	23	None
	4	93	28	
Hansen, 1977w	3	94	1	None
Hansen, 1978b	4	92	22	None
Hansen, 1978l	3	92	9, 16	None
Hansen, 1978m	3	94	27	None
Hansen, 1978p	4	94	15, 17, 18, 29, 32	None
	3	94	7, 19	
Hansen, 1978s	3	93	17, 19, 21, 28, 29	None
Hansen, 1978u	3	93	8, 11, 15	None
Hansen, 1980w	3	94	3, 4, 5, 8, 9	None
	4	94	32, 33, 34, 37	
Hartley, 1983a	3	93	15, 19-22, 29	None
Horvath, 1980	3	93	31	None
	3	94	36	
Jennings, 1978	4	93	29, 31	1 prehistoric site
	4	99	25, 36	
	3	93	6	
Jennings & Sullivan, 1977	2	92	Multiple	None in Danforth Hills
	2	93		
	2	94		
Johnson, 1981a	3	93	2	Historical structure and open lithic sites
Johnson, 1981b	3	93	2-5, 8-11, 14-17	Rock Shelter
	4	93	32-35	
Kainer, 1983	3	94	2, 3	4 prehistoric and historical sites; 13 prehistoric an 1 historical isolated find
	4	94	25, 26, 36	
	4	93	20, 21, 27, 30	
Kuesling, 1983k	3	94	27	None
Knox, 1980	2	92	6	None
Kranzush, 1980b	3	93	7	1 historical site
Kranzush, 1980c	3	93	7, 8, 17-21, 29	1 historical and 2 prehistoric isolated finds
Kranzush, 1982	4	94	35, 36	3 prehistoric and 2 historical sites, 3 prehistoric isolated finds
Lischka, 1975	3	93	Multiple	2 prehistoric and 4 historical sites
Luoma & Jennings, 1980	4	93	6, 29, 31, 32	2 historical sites, 1 isolated find
	4	94	36	

TABLE E-1 (continued)

REFERENCE	*T*	*R*	*SECTION*	*FINDINGS*
Nickens, 1980	3	94	27	None
Nordby, Nickens, 1974	3	93	2-4, 9, 10	1 prehistoric site
	4	93	33, 34	
Piontkowski, 1980	4	93	Multiple	
	4	94		1 prehistoric and 2 historical sites, 3 isolated finds
Schwartz, 1979a	2	93	6, 7	None
	2	94	1, 2	
	3	94	35	
Schwartz, 1979b	2	93	6	None
	2	94	1, 2, 11	
	3	94	36	
Treat & Newkirk, 1981	2	94	11, 14	None
	3	93	17, 18, 19	
	2	93	24	
	2	92	18, 19	
	3	92	24, 25, 27, 35	

TABLE E-2
CULTURAL RESOURCES LOCATED BY INVENTORIES IN THE DANFORTH HILLS

References	OL[1]	SL[2]	OA, SA[3]	SC[4]	OC[5]	RA[6]	H[7]	IF, P[8]	IF, H[9]	IF, UNK[10]
Armstrong, Wignall, 1981	1		2	1	1 (Late pre 3)			2	2	1
Baker, Reed, 1978			1		2					
Baker, Wood, 1978								1		
Gordon et al. 1982								5		
Henss, Anderson, 1979	1						2	8	4	
Jennings, 1978b	1									
Johnson, 1981a	1						1			
Johnson, 1981b		1								
Kainer, 1983	2				2		2	12		
Kranzush, 1980b									1	
Kranzush, 1980c								2		
Kranzush, 1982	2				1		2	3		
Lischka, 1975	2						4			
Luoma, Jennings, 1980							2	1		
Nordby, Jennings, 1974						1				
Piontkowski, 1980	1	2					2	2	1	

[1] OPEN LITHIC (OL): Lithic scatters located in open topographic situations. Material culture includes waste flakes and chipped stone tools. This type is often referred to as lithic scatters, chipping stations, limited loci.

[2] SHELTERED LITHIC (SL): These sites are located in rock shelters, overhangs, or alcoves, and contain chipped stone tools and waste flakes.

[3] OPEN ARCHITECTURAL (OA): Prehistoric sites situated in open topographic situations and containing architectural features. These features may be stone walls, pit houses, stone alignments, enclosures, multi- or single-room structures, or cabins, etc.

[4] SHELTERED ARCHITECTURAL (SA): These sites are similar to open architectural sites, except they are located in rock shelters, overhangs, or alcoves.

[5] SHELTERED CAMP (SC): Sites located in rock shelters, overhangs, or alcoves, and consisting of features or artifacts which indicate domestic activities. The presence of one or more of the following defines the activities: ground stone, ceramics, fire hearth, and middens.

[6] OPEN CAMP (OC): These sites are the same as sheltered camps except they are located in open topographic locations.

[7] TRAILS/ROADS: Path or passage way and/or a prepared path somewhat wider than a trail. Examples: Wise Road, Ellis Trail, and Fortification Trail.

[8] ROCK ART (RA): Petroglyphs and/or pictographs that are not associated with any other class of cultural material.

[9] HISTORIC (H): Sites containing some sort of historical structure, such as cabins, corrals or barns, or historical trash.

[10] ISOLATED FIND: (IF,P; IF,H; IF,unk) Single artifacts or phenomena. There is a wide variety of definitions for this type—use this category when the isolated find form is employed. Other elements will further define this category.

APPENDIX F

MITIGATION CONSIDERED

APPENDIX F

MITIGATION (From Which the Preferred Alternative was Derived)

Because of the unknown nature of actual development, specific methodologies discussed in this appendix have been replaced or augmented by performance standards in Appendix C. This has been done to ensure protection of environmental values, while allowing flexibility on the part of the applicant in alleviating impacts. Specific design criteria may or may not be appropriate at the time of development. Performance standards would be much more applicable because they cover a broad range of potential conditions.

FEASIBLE MITIGATION

Feasible mitigation includes those stipulations that are appropriate at the leasing level, rather than at the mine permitting stage, and are workable and enforceable with current levels of data and information. Some have been incorporated into the Preferred Alternative and/or modified to make them more practical or workable. This section presents major mitigation concerns in order to inform the reader of the range of mitigation considered. It also identifies mitigation as possible stipulations, including supporting rationale and possible methods to meet standards identified in the stipulation. The actual proposed stipulations that were developed from this analysis are referenced at the end of each resource topic discussed.

Wildlife

Possible Stipulation: The lessee would comply with all applicable wildlife regulations, and, in addition, would provide supplemental measures designed for the protection and propagation of wildlife species found in the project area.

Rationale: The existing mitigative measures and regulations may not adequately ensure the protection of all of the wildlife species (and their habitat) found in the project.

Methods: The supplemental methods include:

- Establishing buffer zones wider than 100 feet of stream (boundaries and restrictions to be determined during the permitting process); and/or
- Replacing the vegetation in the proportions of 50 percent shrubland, 25 percent aspen, and 25 percent grasslands, with the postmining aspen stands having a density of 500 stems per acre, which are at least 5 feet in height, and which have survived at least 5 years (although natural stands of aspen have 2 or 3 thousand stems per acre, they are not all 5 feet high, and they do not all survive for 5 years). After discussions with numerous individuals, including Wayne Shepperd, Research Forester with the U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, the standard of 500 stems per acre which are at least 5 feet tall and which have survived at least 5 years, was decided on. Consideration was given to the fact that the site was marginal, that it may be 50 or more years before the post-mining stand would resemble the premining stand, and that any standard must be practical.
- Establishing separate soil stockpiles for the soils removed from aspen stands or directly hauling soils from the present aspen sites to the proposed aspen sites unless this special handling of soils under aspen stands is demonstrated to be unnecessary.

These initial mitigation concerns are represented in BLM's Preferred Alternative by special stipulations 1, 2, 7, 8, 9, 10, and 11.

Water Resources (Surface and Underground)

Possible Stipulation: The lessee would comply with all applicable regulations regarding the replacement of water sources, and, in addition, would, where practical, replace major perennial springs and seeps currently present in the upper reaches of the James Creek watershed. These water sources would supply water until such time when the zones of saturation in the spoils aquifer contact incised valleys and significantly contribute acceptable groundwater to the upper reaches of James Creek.

Rationale: The majority of the springs and seeps in the James Creek watershed will be removed by the mining operation. Decades will be required before significant amounts of good-quality groundwater will emanate from the spoils aquifer in the upper reaches of James Creek. In addition, the concentrations of total dissolved solids are anticipated to be high. Although Consol is committed to the construction of water impoundments, BLM, the Division of Wildlife, or other surface owners, must eventually bear the cost of the maintenance of these structures and the replacement of breached structures. Also, the perennial nature of these sources is questionable.

Methods: Possible methods of fulfilling above stipulation include:

1. Creating "artificial" springs by burying impermeable membranes or other types of aquifuges into the overburden pile during the reclamation phase (although these practices are experimental and unproven, BLM anticipates that they would be successful);

2. Establishing a long-term commitment from the lessee to maintain and replace water impoundments after the reclamation phase; and/or

3. Establishing other measures that will ensure perennial water sources in the upper reaches of James Creek.

These initial mitigation concerns are represented in BLM's Preferred Alternative by special stipulations 13 and 14.

Possible Stipulation: The lessee would comply with all applicable regulations regarding water quality, and in addition, would apply technically feasible methods that will help reduce increases in levels of total dissolved solids and total suspended solids and maintain flows in James Creek that are reasonably similar to premining flows. Specific standards for TDS, TSS, and discharge levels would be determined at the mine plan stage.

Rationale: Mining will remove or adversely impact a major portion of the recharge areas of James Creek. This could cause adverse impacts to James and Good Spring creeks because of reduced flows and increased TDS values.

Methods: Possible methods of fulfilling the above stipulation include:

1. Establishing a stream buffer zone that is wider than 100 feet;

2. Pumping water from the mine pit into James Creek, if the quality is acceptable;

3. Installing a series of channel stabilization structures in James Creek, Little Creek, and Elkhorn Creek: rock structures, drop structures, log sills, check dams, or other acceptable means of retaining or detaining sediment;

4. Constructing a system such as a coal conveyor or slurry pipeline to replace the proposed haul road;

5. Relocating the overburden stockpile out of the headwaters of James Creek;

6. Routing runoff around the overburden and topsoil stockpile areas;
and/or

7. Constructing or establishing other acceptable methods of reducing mining impacts to water quality and quantity.

These initial mitigation concerns are represented in BLM's Preferred Alternative by special stipulations 13 and 14.

Possible Stipulation: The lessee would design a surface and groundwater monitoring plan in accordance with all applicable OSM and CMLRD regulations, and, in addition, shall continue to monitor the established stations J1, J7, J8, J9, J10, J11, J13, G8, and G9; establish a monitoring station immediately downstream from the James Creek and Good Spring Creek confluence; and perform a series of seepage runs before, during, and after mining.

Rationale: The above-mentioned water-monitoring stations are in locations that facilitate the determination of water quality and quantity trends. Seepage runs are necessary to determine the extent and source of groundwater contributions to James Creek.

Methods: Water quality component analyses would be performed at EPA-approved labs. Quantity determinations would be performed by technically acceptable methods.

This concern is represented in BLM's Preferred Alternative by special stipulation 12. Monitoring of hydrologic conditions would already be required during mine permitting, and, therefore, has not been incorporated into the Preferred Alternative.

Cultural Resources

Possible Stipulation: Cultural resources would be identified and significant data retrieved and/or protected in those areas that would be subject to surface disturbing activities.

Rationale: Cultural resource identification and protection is mandated by various Federal laws and regulations. Measures are needed to mitigate potential impacts.

Method:

1. Inventory would be conducted in those areas that have not previously been inventoried and will be subjected to surface disturbing activity.

2. Inventory would be conducted by a qualitified professional cultural resource professional.

3. A report of the inventory and recommendations for protecting identified cultural resources would be prepared and submitted to the reviewing Federal/state agencies.

4. All identified cultural resources would be protected until a mitigation plan has been prepared, accepted by Federal, state agencies and fully implemented.

5. Cultural resources not previously identified that are discovered during mine development and operation would be protected and BLM would be notified.

This concern is represented in BLM's Preferred Alternative by special stipulation 15.

Paleontological Resources

Possible Stipulation: The lessee would comply with all applicable regulations regarding paleontolotical resources, and in addition, would follow methods listed below.

Rationale: Existing mitigative measures and regulations do not adequately ensure the protection of paleontological resources.

Classification	*Mitigation*
Critical (Class I-A) Any locality from which holotype or critical reference material (i.e. paratype, lectotype, etc.) has been collected. Any type geologic reference section which is critical for future references.	Critical No action will be allowed which will damage the fossil resource or alter the contextural relationships of fossil materials. Materials may be removed, but by special permit only to qualified professionals.
Significant (Class I-B) Any locality which contains rare, exceptionally well-preserved or critical materials for stratigraphic or paleoenvironmental interpretation.	Significant Depending on the size of the deposit, approved mitigation may include total salvage or may be limited to a statistically valid sample of all forms present.
Important (Class II) Any locality which has produced plentiful, relatively common in the locality and elsewhere, fossil materials which are useful for stratigraphic and variability studies.	Important A statistically valid sample will be obtained to mitigate any adverse impact on the resource.
Insignificant Any locality which produces poorly preserved, common elsewhere or stratigraphically unimportant material.	Insignificant Mitigation is optional.
Unimportant (Class III) Any locality which has been intensively surveyed and determined to be of mineral scientific interest. This can include the outcrop of geological formations described as unfossiliferous in technical journals or publications.	Unimportant No mitigation necessary,

Table F-1 Paleontological Mitigation Level

Method: The supplemental methods include:

- The lessee would contact the authorized officer of the appropriate state or Federal agency to determine whether the lessee must conduct and fund a paleontological appraisal prior to disturbing the land.

- Lessee would protect all paleontological finds in conformance, as required, in the approved mining and reclamation plan.

- Lessee would immediately bring any such paleontological finds that might be altered or destroyed by mining or reclamation to the attention by mining or reclamation to the attention of BLM prior to moving or altering the find.

Table F-1 lists the classification and level of mitigation for each class.

This concern is represented in BLM's Preferred Alternative by special stipulation 16.

Geologic Hazards.

Possible Stipulation: The lessee would design postmining topography to minimize landslides or slumping of hillsides.

Rational: Small landslides and slumping of hillsides are a problem on portions of the tract. Measures may be needed to prevent slumping and subsequent erosion.

Method: Reclamation and replacement of the steeper slopes may require dewatering and backfill material during spring snowmelt months. Because this concern is appropriately analyzed and resolved during the permitting process, no special stipulations have been incorporated into BLM's Preferred Alternative.

Floodplains.

Possible Stipulation: If loadout facilities and/or transportation facilities are located within the 100-year floodplain boundary, the operator would install appropriate flood control measures for the control of runoff and sediment. (As proposed, no coal excavation activities will take place within the 100-year floodplain.) Care would be exercised in designing flood control measures to ensure protection of Highway 13/789 and the ranch property located about three-fourths of a mile downstreem from James Creek and Good Spring Creek confluence.

Rationale: If a facility is located within the narrow floodplain boundaries, and not designed with the protectin of the facility itself and other property in mind, development could constitute a hazard.

Method: Design facilities to safely pass 100 year precipitation events if they are located in 100 year floodplains.

This concern is included in the Proposed Action (special stipulation 6) and BLM's Preferred Alternative as special stipulation 12. Design criteria for facilities to safely pass 100 year precipitation events is already required as part of the permitting process. The special stipulation reflects Consol's and BLM's additional commitment to minimize impacts to the James Creek channel and floodplain.

INFEASIBLE MITIGATION

The following measures are provided here for the readers' information because they were initially considered as mitigative measures. These measures deal with the design of mining operations. Because the actual configuration and development will not be proposed until the permitting process, these mitigation measures would be premature, might prove to unneccessarily encumber mining operations, and may not mitigate impacts as anticipated. For these reasons, and those explained for each mitigation measure, they have been dropped from consideration.

Establishing A Large Buffer Strip

Establishing a large buffer strip would prohibit surface disturbing activities in a large area adjacent to James Creek. The boundaries of this buffer strip would be based on specific elevations and would have varied, depending upon the location in the watershed and the degree of slope. The buffer strip boundary would vary from 8,000 feet in elevation in the headwaters to either 7,400 or 7,800 feet on the north end of the PRLA, depending on the aspect. The surface area taken out of coal production would have been about 430 acres. The haul road would have been relocated to the east out of James Creek.

Taking large amounts of coal out of production would not necessarily mitigate impacts to affected resources to any greater degree than a smaller buffer strip and would have unnecessarily hindered the recovery of the coal resource. The concern of the BLM is that impacts be mitigated to an acceptable level, not necessarily that an area be precluded from development.

In addition, moving the haul road out of James Creek would cause more surface disturbance with the construction of the new road and a possible increased safety hazard from large coal trucks traveling steep grades.

Changing Mining Sequence

Commencing mining operations on the north end of the PRLA and establishing a large buffer strip would have delayed the impacts to water and wildlife resources. This would be possible because the overburden and topsoil storage areas and actual coal excavation would not have destroyed the headwater areas of James Creek during the first few years of operation. The PRLA's water supply and associated forage and cover would remain unaffected for a longer period.

This alternative was deemed to be unworkable because of the increased depth to coal on the north end in conjunction with the added expense of mine development during the early years of mine operations, and the delay rather than actual mitigation of impacts.

Designing Specific Pit Configurations

Slanting the pit bottom in preselected areas in the headwater areas of James Creek to assist in directing groundwater from the spoils area toward the headwaters of James Creek would have assisted groundwater movement into James Creek. However, this process was deemed not technically feasible since the coal seams and geologic configuration do not slant in the appropriate direction in the appropriate locations.

APPENDIX G

COMMENTS ON THE DRAFT EIS AND RESPONSES

1

U.S. Department of Housing and Urban Development
Denver Regional Office, Region VIII
Executive Tower
1405 Curtis Street
Denver, Colorado 80202-2349

December 18, 1985

Mr. Greg Goodenow
Project Manager
Bureau of Land Management
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

This is in response to your request for comments on the Draft Environmental Impact Statement (DEIS) for the James Creek Coal Preference Right Lease Application, November, 1985. The proposed action is located in Rio Blanco County, Colorado, in the Craig District, Bureau of Land Management.

Your DEIS has been reviewed with consideration for the areas of responsibility assigned to the U.S. Department of Housing and Urban Development. This review considered the proposal's compatibility with local comprehensive planning and impacts on urbanized areas. Within these paramenters, we recommend close coordination with local government jurisdictions in the following areas:

1-1 1. The extent and timing of infrastructure development required to support the proposed action's share of the projected population increase of 2,300 persons in the Craig District impact area.

1-2 2. The extent and timing of community services required to support the proposed action's share of the projected population increase of 2,300 persons in the Craig District impact area.

If we may be of further assistance, please contact Mr. Myron Eckberg, Environment Specialist, at 844-3102.

Sincerely,

Robert J. Matuschek

Robert J. Matuschek
Director
Office of Community
Planning and Development

2

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

RECEIVED
BUREAU OF LAND MGMT.
CRAIG, CO 81625
'85 DEC 23 AM 11:41

December 18, 1985

Regulatory Section

Mr. Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

We have reviewed the James Creek Draft Environmental Impact Statement (DEIS).

The potential action does not conflict with Corps of Engineers responsibilities for flood control, navigation, or other water resource developments in the area.

2-1 In terms of Corps of Engineers regulatory requirements, however, we feel in general that the DEIS does not disclose all of the environmental consequences associated with coal production development. The DEIS fails to address the apparent need for a Department of the Army Permit for the discharge of dredged or fill material into the waters of the United States, their adjacent wetlands, and isolated wetlands that may occur in the development area. Although the document eludes to the possible loss of wetlands it fails to disclose specific impacts or provide feasible mitigation measures.

2-2 In order for the Corps of Engineers to review and evaluate the effects of any discharge of fill material in the six drainages consisting of James Creek, Good Spring Creek, Curtis Creek, Ninemile Draw, Elkhorn Creek, and Little Creek a description of potential impacts and development projects which contribute to those impacts should be included in the Final EIS. Specific comments to the DEIS are as follows.

2-3 1. Page 13, last paragraph - It would appear that in order for the applicant to meet all of the conditions and stipulations a description of wetland impacts and acceptable mitigation would have to be disclosed.

2-4 2. Page 16, last 2 paragraphs - The Final EIS should provide site locations for the stockpile of topsoil, overburden, and interburden which avoid streams and wetlands.

2-5 3. Page 20, paragraph 8 - A proposed mitigation plan for wetland loss should be presented in Appendix D or provided as a separate appendix.

2-6 4. Page 22, Vegetation Section - Replacement of wetlands could involve reestablishing vegetation and should be included in the Final EIS.

2-7 5. Page 25, Major Federal Laws - The Corps of Engineers should be included in Appendix B summaries under the Clean Water Act.

2-8 6. Page 61, First and third paragraphs - A wetland map identifying rail line alignment along Good Spring Creek and haul road alignment along James Creek should be included in the Final EIS. The specific type of activity at the headwaters of James Creek which could alter the Williams Fork aquifer system is not disclosed. Consol's commitment to reestablish wetlands (Appendix C) should be presented as a mitigation plan.

2-9 7. Page 93, Feasible Mitigation Section - This section should include mitigative measures for wetland replacement.

2-10 8. Page 99, Federal Agencies - The Corps of Engineers should be listed as a consulting agency due to the magnitude of possible wetland impacts.

2-11 9. Page 114, Appendix B - Clean Water Act of 1977 - Wetlands should be listed in the Purpose and Major Relevance column of this law with the Corps of Engineers included as the responsible regulatory agency.

2-12 10. Page 121, H. - The Corps of Engineers should be included as a participating agency in the development of wetland mitigation.

Thank you for the opportunity to review and comment on the DEIS. If you have any questions, please contact Mr. Ken Jacobson in our Grand Junction Office at telephone (303) 243-1199.

Sincerely,

Art Champ

Art Champ
Chief, Regulatory Section

1-1 The impacts have been identified in the text. Copies have been made available to state and local governments.

1-2 No dates have been identified at this time for mine construction. There will be additional opportunities for local community involvement during the permitting process, prior to mine development.

2-1 - 2-6, 2-8 - 9, 2-12
The specific concerns that your comments address will be considered during the permitting process. We recognize the importance of riparian/wetland areas. It is for this reason we have identified them in this leasing level EIS. The general requirements outlined in Appendix C do not relieve the applicant from fulfilling other statutory or regulatory requirements during the permitting process. Your concerns can be best be addressed during the permitting process when a more definite proposal for development is available. By its inclusion in this EIS your request to participate in wetland mitigation will be forwarded to the Office of Surface Mining Reclamation and Enforcement.

2-7 The change has been made.

2-10 The correction has been made.

2-11 The change has been made.

3

Consolidation Coal Company
Consol Plaza
Pittsburgh, Pennsylvania 15241
(412) 831-4000

December 30, 1985

Mr. Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson Street
Craig, CO 81625

Dear Greg:

Attached please find comments from Consolidation Coal Company concerning what we feel are errors in the draft EIS. I wanted to get these particular comments to you early so that you could begin any necessary redrafting of maps, figures, etc. to correct these errors for the final document. For the most part, these errors relate to maps and figures in the draft EIS.

In about two weeks, I will be sending you the second and more important part of our comments, those dealing with certain environmental issues and proposed lease stipulations which we do not agree with the current BLM interpretation or position. We would like an opportunity to meet with you and certain members of the EIS staff to go over these concerns rather than just mail them in. If possible, could we arrange such a meeting just prior to or after the public meetings on January 15 and 16?

Most of the issues of concern are fairly technical and would not be well suited to an oral statement at the public meetings. However, if we can not meet with you and your staff to go over these comments, I will condense them for a 10 minute oral presentation. Please advise me as to the options that we have.

I will continue to prepare our detailed comments and wait to hear back from you concerning how we are to present them to BLM.

Sincerely,

Gary W. Goodrich

Gary W. Goodrich
Manager, Environmental
Permits

GWG:rj

Attachment

Draft EIS - James Creek Coal PRLA Possible Errors

3-1
p. 11 - Projected Demand for Northwest Colorado Coal

Sixteen to twenty million tons of coal should be described as an annual demand.

3-2
p. 12 - Map 2-1

Dashed line for coal haulage corridor is hard to identify and should not be superimposed on the highway. A Nine Mile Gap rail spur would actually be high on the valley side (east) as it climbed to Nine Mile Gap. Legend reference to "Drainage Access Road Disturbed" is confusing and should be changed to "total area disturbed".

3-3
p. 17 - Map 2-2

Coal lease boundaries do not show up and legend reference to "U.S. Coal Lease" indicates that the entire map area is a U.S. Coal Lease.

3-4
p. 18 - Map 2-3

We suggest that you label all of the sections possible for better clarity.

3-5
p. 19 - Figure 2-3

Needs page number - 930 ft. depth in spoil is an error, should be 150 ft. All dimensions used on this figure are unclear as to which areas they refer to. References to angles are unclear. This figure should be redrafted.

3-6
p. 21 - Map 2-4

Needs page number, PRLA boundary unclear, base contours are in metric, it is unclear as to what is being referred to as Consol's proposal. Overall, this map is very confusing and poorly prepared, we suggest deleting it or drafting a new one.

3-7
p. 23 - Item 8, last sentence.

This sentence was borrowed from the initial EA and is inaccurate. As such, the sentence should be changed or deleted.

3-8
p. 28 - Socioeconomics

No basis is given for the predicted 2300 person increase in population for the no action alternative.

3-9
p. 37 - Map 3-1

Scale is in error, title is incorrect, should read "Potential Alluvial Valley Floors" or better yet, this map should be deleted as the text does not identify any AVF's on the PRLA. This map is not referenced until page 38.

3-10
p. 39 - Figure 3-1

This figure is completely out of place, it is not referenced until page 58. Where is the "Twentymile Sandstone", which seems to be a common reference stratum in the Williams Fork formation?

3-11
p. 53 - Second Column, First Paragraph.

The report range of "1,000 to 3,900 mg/l" should read "2,000 to 3,900 mg/l".

3-12
p. 68 - Map 3-10

Wrong scale, it is unclear if there are any active Cooper's Hawk nests shown on the map.

p. 73 - Map 3-11

3-13 Wrong Scale. There are several errors in land ownership, several areas within and directly adjacent to the PRLA that do not have ownership identified. This map should be redone.

p. 74 - Map 3-12

3-14 Wrong Scale. Road #30 is closed due to landsliding and should be so identified. The Jensen ranch is not a residence and should not be identified as such. This is very misleading. Are there residences along Highway 13 with associated telephone and/or power line rights-of-way? This map is very poorly done and the information contained could easily be combined on Map 3-11.

p. 91 - Map 3-13

3-15 There are areas of private coal ownership which are incorrectly identified as federal coal on this map.

4

Consolidation Coal Company
Consol Plaza
Pittsburgh, Pennsylvania 15241
(412) 831-4000

January 6, 1986

Mr. Greg Goodenow,
Project Manager
Bureau of Land Management
455 Emerson Street
Craig, CO 81625

Dear Greg:

The following comments are in addition to the probable error list which I forwarded to you on December 30.

The comments included in this memo and the December 30 memo are submitted as probable errors for your consideration in preparing the final EIS. As such, it is not important to us that those comments appear in the final EIS.

As I mentioned in the previous memo, our more detailed comments will be forwarded to you by mid-January. We will request that those comments appear in the final EIS. As discussed on the phone, we plan to meet with you and your staff in Meeker on January 15, prior to the public meeting, to go over these detailed comments. Given this chance to present our remaining concerns, I do not plan to make a statement at the public meeting. If you feel that this would be a problem, please inform me.

Sincerely,

Gary W. Goodrich

Gary W. Goodrich
Manager, Environmental
Permits

GWG:jd

Attachment

Draft EIS - James Creek Coal Possible Errors (Continued)

4-1 Page 20 - Transportation of Coal From the PRLA (Second Paragra
Consol is not aware of a railroad company named Colorado
Wyoming. Is this the company holding the Colowyo Spur?

4-2 Page 21 - Map 2-4
The tie into the existing Colowyo line is incorrectly loc
on this map.

4-3 Page 50 - Map 3-3
Incorrect scale.

4-4 Page 52 - Map 3-4
Incorrect reference to "1936" CDM report.

3-1 The correction has been made.

3-2 The map has been changed.

3-3 We recognize that the entire map is not a U.S. coal lease. Lease lines faded out during the printing process. The map has been moved to Appendix D.

3-4 The map has been clarified.

3-5 The map has been clarified to indicate scale.

3-6 The map has been redrafted.

3-7 The text has been clarified.

3-8 Please refer to the no action/no development alternatives section in chapter 2 and the economic section in chapter 3 for a detailed discussion.

3-9 The text under "Alluvial Valley Floors" defines significant and insignificant alluvial valley floors. No determination has been made at this time as to significance. The scale has been corrected.

3-10 Figures 3-1 has been moved. The Twentymile Sandstone is an important marker bed in the Williams Fork Formation throughout the Yampa Coal Field, however; the PRLA is located in the Danforth Hills Coal Field which is separated from the Yampa Coal Field by the Axial Basin Anticline. In both fields, Williams Fork Formation is the main coal bearing unit but the environment of deposition were slightly different. Nomenclature varies from one field to the other due to separate histories of exploration. The Twentymile Sandstone is not considered to exist in the Danforth Hills. Some geologists think the Twentymile might correlate to the Lion Canyon Sandstone in the Danforth Hills, at least in time. (Personal Communication, 1985, Brownfield). Correlation studies between the regions continue today.

3-11 The text has been corrected.

3-12 The map has been corrected and updated.

3-13 The scale and the ownership have been corrected, and ownership directly adjacent to the PRLA has been identified.

3-14 The scale on the map has been corrected. Road #30 was closed. However, this is a temporary closure, and the road may be reopened, according to Rio Blanco County. We feel that there is no need to show powerlines or telephone lines within the Highway 13 right-of-way separately because they will not be affected. The Jensen Ranch is seasonally occupied.

3-15 These maps are designed to show general location only. Other maps in the document identify private coal tracts.

4-1 Page 20 -- Thank you for the correction.

4-2 The map has been clarified.

4-3 The scale has been corrected.

4-4 The reference has been corrected to read 1984.

5

CONSOL

Consolidation Coal Company
Consol Plaza
Pittsburgh, Pennsylvania 15241
(412) 831 4000

January 9, 1986

Mr. Greg Goodenow
Project Manager
Bureau of Land Management
455 Emerson Street
Craig, CO 81625

Dear Mr. Goodenow:

Enclosed are comments submitted on behalf of Consolidation Coal Company with respect to the draft Environmental Impact Statement - James Creek Coal Preference Right Lease Application published in November, 1985. These comments address the accuracy of the discussions of the existing environment and the proposed action, and the appropriateness of the proposed lease stipulations (Appendix C).

We would appreciate your careful consideration of these concerns as you consider text changes for the final EIS. We are prepared to further clarify these concerns with your staff, as requested, or to further clarify our proposed action and associated mitigation plans in response to other comments.

It is possible that additional concerns will come to our attention prior to the close of the comment period on February 24. Therefore, we would like to keep the option available to submit additional comments prior to that date.

Consolidation Coal Company appreciates your continuing efforts to produce a timely, accurate and concise document.

Sincerely,

Gary W. Goodrich
Manager, Environmental
Permits

GWG:jk

Enclosures

Substantive Comments - James Creek Coal EIS

Page vi - Table S-1, Wildlife

5-1 Consol continues to object to the use of "300 elk" for a quantification of impacts to the elk herd on the PRLA. We do not believe that this number has any basis in fact, as it is not supported by the detailed 30 month survey conducted on the PRLA. Consol requests that BLM identify where this number comes from. Does it relate to the PRLA, the PRLA and surrounding leases, or some other area of impact? The site-specific study conducted by CDM provides cow densities for the PRLA for three calving seasons, yet these numbers were not used in summarizing wildlife impacts.

Page vi - Table S-1, Vegetation

5-2 Which rail line is used to determine that 152 acres of wetlands and meadows are to be lost? BLM has not considered wetlands mitigation or avoidance of significant hayfields when developing this number. As mentioned in the text, possible railroad impacts should be handled in a later analysis, once a route is established.

5-3 This extremely speculative impact should be deleted from the final EIS.

Page 20 & 22 - Transportation Of Coal From The PRLA

5-4 Consol recommends that BLM delete the first and fourth paragraphs and Map 2-4 from the final EIS, as they represent pure conjecture by the BLM. Consol has presented no plans

for tail tracks in the James Creek drainage. BLM accurately states that an additional analysis can be prepared, once a rail proposal is brought forward.

Page 22 - Soils (Last Paragraph)

5-5 A sentence should be added to allow for aspen reclamation techniques which are proven elsewhere (in the timeframe between this analysis and actual mine construction) to be incorporated into the reclamation plan without reanalyzing them through an aspen reclamation study. See additional comments regarding Appendix C stipulations.

Page 22 - Vegetation (Item 1, 2, 3)

5-6 Consol continues to object to the arbitrary bond release standards proposed for aspen areas. BLM should state the basis for increasing the height requirement and the survival criteria from the established CMLRD criteria. These bond release standards should be evaluated as part of the aspen reclamation study. See additional comments regarding Appendix C stipulations.

Page 25 - Other Production Levels (Last Paragraph)

5-7 BLM is processing all PRLA's because of regulatory and policy mandates. This paragraph adds nothing to this analysis and should be deleted or rewritten.

Page 28 - Socioeconomics - No Action-No Development

5-8 BLM should explain the source of the 2300 person increase in population for the no-action alternative.

Page 28 - Summary Of Unsuitability Analysis (Item 1)

5-9 Provisions should be allowed for an agreement between Consol and the public road authorities to allow impacts within 100 feet of the road right-of-way. These should be described as exceptions to the unsuitability determination. See additional comments regarding Appendix X stipulations.

Page 47 - Environmental Consequences - Impacts

5-10 BLM does not do an adequate job in describing the unstable conditions which exist naturally in the James Creek watershed. These conditions include an unstable and erosive channel configuration, an immature longitudinal stream profile which is prone to additional downcutting, the catastrophic loss of most impoundments, sedimentation at the mouth of James Creek, high dissolved solids during periods of low flow and high suspended solids during periods of high flow.

The reader has no idea, from reading the BLM hydrology discussion, of the current conditions and probable future changes (without mining) in the James Creek drainage. Consequently, the reader is inaccurately led to believe that no development will result in the continuation of a stable watershed, but that mining will potentially create instability in the watershed. Consol requests that the pre-mining conditions of James Creek be more accurately detailed in the final EIS to provide a valid comparison of potential mining-related impacts to the no-action scenario.

Page 47 - Environmental Consequences - Impacts - Development Alternatives

5-11 BLM reports "calculations" which indicates that 40-400 years will be needed before James Creek headwaters receives spoil aquifer contributions. This order of magnitude range appears to be more of a guess than a calculation and does not provide any basis for an assessment of impacts. BLM should, at a minimum, include the "calculations" used in making this statement. In addition, discussion of TDS concentrations of 3000-3900 mg/l is inconsistent with other TDS ranges reported in the groundwater section.

Page 55 - Environmental Consequences - Impacts - No Action-No Development Alternatives

5-12 Again, BLM makes no effort to describe the current erosion - sedimentation cycles which occur during a peak flow event. Considerable sedimentation occurred at the mouth of James Creek during 1984, and can be expected again during future flood events. The reader of this EIS is totally uninformed

concerning the natural instability of the James Creek floodplain. This lack of information results in an overemphasis of the potential mining impacts to the floodplain stability.

Page 55 - Coal-Affected Environment - Structure (Third Paragraph)

5-13 This narrative providing a regional discussion of dip does not apply to the PRLA and surrounding areas. Figure 3-6 illustrates a contradicting pattern. As such, the narrative is misleading and it is inappropriate to suggest that beds in the area dip to the northeast and northwest.

Page 57 - Map 3-6

5-14 No source is given for this map. Consol questions why some structure contours are dashed (especially through the PRLA) and solid in other areas. Does this suggest that more detailed information is available in the surrounding areas? If so, the information should be documented. Consol believes that we have better structure information on the PRLA than the map suggests. What is meant by the dashed line in T.4N R.93W?

Page 58 - Coal Reserves (First Paragraph)

5-15 Consol suggests that BLM delete the sentence "Sources disagree on recoverable reserves" as it is unsupported and unrelated to the previous sentences in the paragraph.

Page 62 - Elk, Affected Environment - Calving Habitat (Last Sentence)

5-16 Consol continues to object to the very misleading statement that 300 calving elk could be affected within the PRLA by the proposed mine plan. CDM studies (minimum population counts) indicate that 102 cows were observed in James Creek during 1983 calving seasons and 63 cows during 1984. BLM is obviously using an independent source of information to come up with the 300 elk count, and this should be reported in the EIS. Consol considers this number inaccurate and very misleading as printed.

Page 62 - Elk Affected Environment - Winter Ranges

-17 This discussion is extremely biased and only uses one small piece of the winter range information gathered during the Meeker Elk Study. Why does BLM continue to use only 1983-84 data and conclude with the point that this winter was too severe to get an accurate assessment of winter activity on the PRLA? The winter of 1984-85 was typical and still showed minimal elk activity on the PRLA during the winter. The 30-month study clearly shows that the PRLA, for the most part, is not critical winter habitat. Key wintering areas occur in the Axial Basin (north of the PRLA) for this portion of the White River Elk herd. It is unclear why BLM continues to provide a distorted discussion of this winter activity. Consol again offers the following language changes for this section:

5-17 cont. Baseline studies (CDM 1984b) indicate that while the greatest concentrations of wintering elk occurred at elevations below 7,000 feet in Axial Basin and White River Valley during the winter of 1983-84, no large concentrations of elk were detected within boundaries of the project area. During the winter of 1983-84, the majority of the project area was not available as winter range because of abnormally heavy snow cover. Precipitation recorded at Meeker, Colorado during October 1983 - April 1984 was 180 percent of the 1961-80 average. By comparison, results of elk monitoring studies completed during the winter of 1984-85, which approached 1961-80 norms of precipitation and temperature, indicated that elk densities within the PRLA did not differ significantly from those recorded during the severe winter of 1983-84 (CDM 1985). Elk densities recorded within the PRLA during the winter of 1984-85 ranged from 12.4 elk/mi^2 during November 1984 to 1.7 elk/mi^2 during March 1985 (CDM 1985a). Surveys during the winter of 1983-84 and 1984-85, indicated that elk were most abundant and widely distributed below 7,200 foot in the White River Valley, Axial Basin, and the lower reaches of Elkhorn and Little Creeks, as they were during the severe winter of 1983-84. Within boundaries of the Meeker PRLA, elk were most abundant in Ninemile Draw (between Coal Creek and Highway 13) during the winters of 1983-84 and 1984-85 (CDM 1985a).

best copy available

5-1 Page 66 - Environmental Consequences - Impacts - Development Alternatives (Third Paragraph, Sixth Sentence)

"Roughly 25 percent of the project area is an elk winter concentration area." This statement misrepresents results reported in the 1984 Elk Baseline Report (see page 4-23) and results of the Monitoring Study Report (page 5-3). Wording of this statement should be to the effect that on the basis of professional judgment, the Ninemile Draw area (south aspect) was identified as a potential winter concentration area. It should also point out that this area is an avoidance area. At present, the reader is led to believe that the area designated as a potential winter concentration area lies within the mine plan area; this is inaccurate.

5-19 Page 67 - Mule Deer Environmental Consequences

General Comment: Wildlife biologists working on the Meeker Elk Study are in general agreement that CDOW 1041 estimates of deer densities are not based upon site specific observations, are 11 years old, and are not confirmed by the observations of deer using the PRLA during the Meeker Elk Study. The CDOW 1041 data probably overestimate deer usage of the PRLA area. BLM should qualify the use of these numbers with a discussion of how they were derived.

5-20 Page 69 - Environmental Consequences - Impacts

The discussions of the great-horned owl nest should be deleted from this section, as the nest was destroyed by a mudslide in 1984.

5-21 Page 69 - Game Birds And Waterfowl Affected Environment

Consol continues to object to the use of 13-21 sage grouse per square mile for Game Management Unit 12 as being descriptive of the PRLA area. GMU 12 includes the Axial Basin sagebrush valleys, where the sage grouse commonly occur. The use of this density estimate is totally misleading for the PRLA and should be deleted.

Page 93 - Mitigation (From Which The Preferred Alternative Was Derived)

Consol's comments regarding this section are the same as those submitted later in this document for Appendix C.

5-22 Appendix A, Page 105 (First Column, Item 1)

An exemption should be provided for development within 100 foot of the public road right-of-way if necessary approvals are obtained from highway authority and CMLRD. See additional comments regarding Appendix C stipulations.

5-23 Appendix A, Page 105 (First Column, Item 3)

Consol continues to disagree with the BLM assessment that the PRLA is "crucial in maintaining present characteristics of the main White River elk herd." We do not think that the elk study supports the use of "crucial", and that this wording should be changed. Although all parties seem to agree that with mitigation, impacts to elk should be acceptable, neither

the BLM or CDOW have noted that the habitat qualities of the PRLA for elk may not be as critical or crucial as was thought before the 30-month elk study. Selecting a word other than "crucial" in this paragraph would help give some indication that the study results were considered.

5-24 Page 120 - Appendix C, 1. Wildlife, Proposed Action

General Comment: The details contained under the proposed action stipulations are in general agreement with the proposed Consol Elk Mitigation Plan. However, the organization of the various requirements leaves questions regarding the timing of the mitigation plan implementation. Items C, D, E, F, and G are all part of the habitat recovery and replacement plan to be submitted concurrently with filing the mining permit application required by SMCRA and Colorado regulations. Accordingly, Consol requests that the proposed wildlife stipulations be renumbered according to the following system:

5-24 cont.

BLM Proposed Wildlife Stipulation #	Consol Proposed Wildlife Stipulation #
o Proposed Action	
A.(1)	A.(1)
A.(2)	A.(2)
B.(1)	B.(1)
B.(2)	B.(2)
C.	A.(4)
D.	A.(3)
D.(1)	A.(3)(a)
D.(2)	A.(3)(b)
D.(3)	A.(3)(c)
D.(4)	A.(3)(d)
E.	A.(5)
F.	A.(7)
G.	A.(6)
G.(1)	A.(6)(a)
G.(2)	A.(6)(b)
G.(3)	A.(6)(c)
G.(4)	A.(6)(d)

5-24 cont.

BLM Proposed Wildlife Stipulation #	Consol Proposed Wildlife Stipulation #
o BLM's Preferred Alternative	
H.	C.
I.	D.
J.	E.
K.	F.
L.	G.
M.	H.
N.	I.

Page 120 - Appendix C, 1. Wildlife, Proposed Action, B.

5-25 In general, Consol agrees with the intent of this stipulation which is to preserve the proposed elk avoidance areas until suitable habitat is reestablished in the proposed mining areas. However, it would be possible to mine coal by underground methods within these avoidance areas without causing significant disruptions to the wildlife habitat. Although underground mining is only a remote possibility at Meeker, (either as an extension to the proposed surface mine or as a concurrent operation), Consol would prefer to keep the option open. It is possible that a remote fan site, power borehole, or shaft location would need to be located in

5-25 cont. an elk avoidance area to facilitate underground mining. Consol is requesting a provision to allow for remote support facilities for underground mining in the elk avoidance areas if:

1. It can be reasonably demonstrated that the facility would not affect any critical elk use of the avoidance area,
2. The disturbance is compensated for by in-kind mitigation.

Page 121 - Appendix C, 1. Wildlife, BLM's Preferred Alternative, H.

Consol continues to object to a lease stipulation concerning in-kind replacement of wetlands based upon the following reasoning:

5-26

1. Wetlands disturbance is addressed by the Clean Water Act and is regulated by the U.S. Army Corps of Engineers. Consultation between the Corps, the U.S. Fish and Wildlife Service and other appropriate agencies would be part of a separate permitting process which would be completed prior to mine construction. Therefore, BLM is:

26 nt.

a. Duplicating a discrete permitting requirement,

b. Stipulating compliance for an issue that is outside their regulatory authority,

c. Stipulating wetlands mitigation without consulting the appropriate regulatory authority, the U.S. Army Corps of Engineers

d. Stipulating wetlandx mitigation for unknown impacts which would be appropriately considered once the detailed mine plan and rail transportation scheme are developed.

Consol is requesting that BLM reconsider the appropriateness of a wetlands lease stipulation and delete this requirement from the final EIS recommended lease form.

Page 122 - Appendix C, Stipulation 1. J.

7 The proposed lease stipulation for compliance with Section 7 of the Endangered Species Act is a duplication of Colorado Mined Land Reclamation Division (CMLRD) regulations 2.04.11(4) and 2.07.6(2)(N), which must be complied with at the mine permitting stage. CMLRD routinely consults with USFWS concerning Endangered Species Act issues, and proper mitigation will be developed at mine planning. In addition,

rule 2.07.6(1)(a)(ii) requires CMLRD to consult with USFWS and CDOW prior to approval of the fish and wildlife portion of the mine permit application. BLM should not duplicate existing regulations as lease stipulations, and should therefore delete this stipulation.

Page 122 - Appendix C, Stipulations 1. K.(1) & (2)

5-28 Involvement of the USFWS and CDOW in wildlife issues is provided by CMLRD rule 2.04.11. Consol's compliance with this rule is required during the mine permitting process, at which time potential impacts to raptor nests will be much better defined. Protection of raptor nests relates to several Federal Laws administered by the USFWS. A written notification of a mine permit application is sent to USFWS under CMLRD rule 2.07.3(3)(b)(i). Rule 2.07.6(1)(a)(ii) requires consultation with USFWS and CDOW prior to approval of the fish and wildlife plan submitted with a mine permit application. Adequate provisions exist for USFWS concerns to be protected during the established mine permit application process. Therefore, this proposed raptor stipulation is duplicative and should be deleted.

Page 124 - Appendix C, Stipulation 2.A.2. (Fourth Paragraph, Study of Aspen Reclamation Techniques)

5-29 It is possible that considerable time could pass between lease issuance and construction of a surface mine at Meeker. During the intervening years, considerable information concerning successful aspen reclamation techniques could be developed at surrounding mines or through applicable research. Consol requests a provision to forego certain portions of the aspen reclamation study if the necessary techniques for aspen reclamation have been previously documented prior to developing a mine at Meeker.

5-30 Page 124 - Appendix C, Stipulation 2.A.2. (Fifth Paragraph)

Consol requests that BLM replace this stipulation regarding special handling of aspen topsoil with the following language:

"As part of the required studies of aspen reclamation techniques, Consol will compare the use of segregated topsoil from previous aspen areas with recombined soil from various vegetation types and locations. If separately handled aspen soils show statistical improvement in reclaimed aspen densities and growth over other recombined soils, pre-mining aspen soils will be separately handled to areas of the backfill where aspen are to be reestablished."

The current BLM stipulation uses an apparently logical, yet untested opinion (that segregated topsoil from aspen areas will produce a better reclaimed aspen stand than an equal depth of unsegregated topsoil) to establish an expensive reclamation standard for Consol to meet. The BLM then allows

Consol to study the use of separately handled aspen soils to see if the technique is truly effective. Perhaps depth of soil and aspect are the key factors in providing an aspen rooting medium, irrespective of where the material was obtained. Perhaps mixed topsoil will provide a more favorable rooting medium (i.e., in texture) than separately handled aspen soils, when equal depths are compared. An untested, expensive concept such as separately handling aspen soils should be first tested for its relevance to aspen regrowth prior to establishing it as a reclamation standard.

5-31 Page 124 - Appendix C, Stipulation 2.B.3

Consol continues to be concerned that the BLM proposed aspen bond release standards are arbitrary and may place an unrealistic or excessively costly burden on Consol. Current CMLRD rules 4.15.8(7)(a) and 4.15.8(7)(c) indicate that a tree should be in place at least two seasons and be over one foot in height to be counted as a stem. Does BLM have any data to justify the proposed requirement for five feet high trees having survived at least five years? Perhaps trees three or four feet high and surviving three or four years will provide the same prediction of reclamation success. Consol requests that the actual bond release standard for aspen be a subject of the aspen reclamation studies. If Consol can demonstrate with reasonable confidence that a tree shorter than five feet or growing for less than five years is

just a predictive of ultimate reclamation success as a tree five feet high and grown for five years, we should have the opportunity to change the standard accordingly.

5-32 Page 124 - Appendix C, Stipulation C.

This stipulation should be clarified to indicate that sediment ponds will only be allowed to "silt in" following bond release.

5-33 Page 125 - Appendix C, Stipulation 3.D. (Second Paragraph)

Consol agrees with the need for terracing of slopes adjacent to reclaimed waterways. However, we request that BLM delete these design specifications for terracing as they are arbitrary and could result in underdesigned and/or overdesigned terraces on a given slope. Designing terraces to be stable and effective depends upon the percent slope, length of slope, geotechnical consideration, type of proposed vegetative cover, and the special needs to maximize water infiltration for aspen areas. This type of design planning can only occur during detailed mine design. In compliance with CMLRD regulations, Consol must design all terraces to be stable and effective. These BLM proposed guidelines will not be effective in accomplishing this goal, and should be deleted.

5-34 Page 125 - Appendix C, Stipulation 3.E.

Consol continues to object to the BLM discussion that certain transportation methods are preferred over others in James Creek. Stipulation 3.E. is an unnecessary expansion of Stipulation 3.A. and appears to be included to limit Consol's mine planning options by suggesting that a haul road or overburden stockpile might not be suitable for James Creek. Obviously, if Stipulation 3.A. cannot be complied with by using haul roads and overburden stockpiles in James Creek, alternate plans and designs would be proposed by Consol.

Stipulation 3.A. provides the environmental protection stipulation desired by BLM, while Stipulation 3.E. does nothing to improve upon this protection. Consol requests that BLM delete Stipulation 3.E. from the final EIS.

5-35 Page 126 - Appendix C, Stipulation D.

On previous federal coal leases (post-1976), the cost of cultural resource data recovered during the active operation was to be borne by the BLM. This proposed DEIS stipulation requires the lessee to bear these costs. What is the explanation for this change?

Page 127 - Appendix C, 6. Access (First Paragraph, Last Sentence)

5-36 As part of the Consol Elk Mitigation proposal, Consol has committed to provide public hunting access to lands purchased for elk mitigation to compensate for lost hunting privileges on currently available public lands (Jensen Wildlife Area). This compensation would be necessary if the Colorado Division of Wildlife maintains ownership of the Jensen Wildlife Area during mining. As Consol disturbs public access land, similar acreages of private surface would be made available for hunting. Consol cannot commit to maintaining public access and recreational opportunities on all off-site land purchased or leased for elk mitigation. In many instances, such a requirement would conflict with the mitigation purposes of the off-site land. This sentence should be changed to clarify the commitment necessary from Consol.

Page 127 - Appendix C, Stipulation 6 (Second Paragraph)

5-37 Additional clarification should be included to recognize the exemption from this stipulation if an agreement is reached between Consol and the appropriate highway authorities. BLM should recognize that CMLRD rule 2.07.6(2)(d)(iv) adequately protects public road right-of-ways, and that this proposed lease stipulation duplicates that rule.

5-1 The 300 elk that are referenced as being impacted by this action refers to the total number of elk both on and off the developed area. These numbers are supported by discussions with the Colorado Division of Wildlife.

5-2 The 152 acres of wetlands and meadow would be lost as a result of a rail line from the confluence of Good Spring Creek and James Creek along Good Spring to Axial. See the discussion in chapter 3 of impacts to vegetation and transportation of coal from the PRLA in chapter 2.

5-3 and 5-4
As discussed in chapter 2, "Transportation of Coal from the PRLA", the analysis of the rail line is speculative, but has been included in this analysis in order to disclose the full impacts of the project. A more detailed analysis will be made if a rail line is proposed at some time in the future. This analysis would be promoted by a right of way application, or other permitting processes. The text has been clarified to emphasize this point.

5-5 This is within the intent of this analysis. Therefore, the text has been modified to reflect this point.

5-6 BLM's intent is to insure that aspen stands be reestablished. The stipulation in Appendix C has been modified to allow the lessee to demonstrate to the authorized BLM officer that a different, but effective standard, can achieve reestablishment of aspen stands.

5-7 It is included to provide information to the public and respond to questions raised during the scoping process.

5-8 See the response to 3-8.

5-9 A Clarification has been made in the text. Exceptions are allowed for, as identified in Appendix A (43 CFR 3461.1 (c) (2).) An agreement between Consol and the public road authorities may qualify as an exception after a written finding. The text has been clarified.

5-10 The test has been clarified.

5-11 Please refer to Chapter 3, "Surface Water, Environmental Consequences", for an explanation of the numerical estimates.

5-12 The text has been clarified.

5-13 The information was taken from a detailed analysis of the PRLA and the surrounding area by David V. Haines of the U.S. Geological Survey. The description presented in the text also agrees with Map 2-2, "Structure of the Last Mineable Seam". The dip direction averages a northwest direction in the northwestern part of the PRLA, changing to the northeastern direction in the northeastern part of the PRLA and lease C-093713. A discussion of the southern limb of the Danforth Hills acticline has been included.

5-14 The source has been named on the map. This is a regional structure map for the Danforth Hills. Surrounding data was acquired from oil and gas wells and USGS maps and drilling information. Dashed line in T4N, R93W was an error and has been deleted.

5-15 A clarification has been made in the text.

5-16 The source (CDOW) has been added.

5-17 Winter elk use throughout northwest Colorado has changed significantly, both in numbers and areas of use, since the winter of 1983-84. As a result, the Colorado Division of Wildlife is revising the White River elk herd's winter use areas. The area encompassed by the PRLA is still considered to be winter elk range. The text and map 3-7 have been updated to reflect the latest available information from CDOW, which includes an analysis of all CDM data.

5-18 The text has been updated. Analysis relies on Colorado Division of Wildlife (CDOW), which identifies about 75 percent of the project area as a winter concentration area.

5-19 The numbers have been revised to reflect the latest available CDOW estimates.

5-20 The reference to the great horned owl nest has been deleted.

5-21 The 13-21 sage grouse square mile is a general bird density for GMU 12. The PRLA is a part of this unit. As wet meadow areas are extremely important in brood raising and until site specific spring counts can be made the general numbers for bird densities for the GMU will be utilized.

5-22 See response to 5-9.

5-23 The word "crucial" has been changed to "important" to reflect all data presently available.

5-24 The stipulations have been reformated.

5-25 Because elk habitat would be protected, the text has been changed to allow this potentially minimal disturbance, with the exception of changing the word "critical" to "important".

5-26 The language of the stipulation has been changed to mitigate for riparian habitat. The stipulation does not preclude or preempt other requirements.

5-27 The stipulation for compliance with Section 7 of the Endangered Species Act are as a result of BLM policy and as such fulfill BLM regulations.

5-28 The raptor does not require Consol to do anything not otherwise required by law. The stipulations will be left in to satisfy BLM requirements.

5-29 The change has been made.

5-30 See the response to 5-6.

5-31 The stipulation has been modified to allow the applicant the flexibility to substitute an equally effective, but less costly standard.

5-32 The change has been made.

5-33 The change has been made.

5-34 The stipulation has been revised.

5-35 This reflects a change in BLM policy from pre 1976 leases.

5-36 The stipulation has been amended to more accurately reflect BLM's concerns and Consol's commitment.

5-37 A clarification has been made.

6

United States Department of the Interior
BUREAU OF RECLAMATION
UPPER COLORADO REGIONAL OFFICE
P.O. BOX 11568
SALT LAKE CITY, UTAH 84147

IN REPLY REFER TO: UC-151
120.1

JAN 9 1986

Memorandum

To: Mr. Greg Goodenow, Project Manager, Bureau of Land Management, 455 Emerson Street, Craig, Colorado 81625

From: Regional Director
Bureau of Reclamation

Subject: Review of Draft Environmental Impact Statement, James Creek Coal Preference Right Lease Application

We have reviewed the subject document and have concluded that the proposed coal lease near Meeker, Colorado, should not affect any Reclamation activities.

6-1 We suggest that the final report estimate increases in total dissolved solid concentrations in the Colorado River system. These increases should be minimized where possible.

6-2 The report indicates that existing springs in the area will be impacted and that the owners of these springs could receive compensation. We feel that the details of this compensation should be presented in the final report.

Thank you for the opportunity to review the subject document.

cc: Mr. Robert Stewart
Regional Environmental Officer
Department of the Interior
Denver Federal Center
Building 67, Room [illegible]
P.O. Box 25007
Denver, Colorado 80225

7

A-95 Review 810

STATE OF COLORADO
DEPARTMENT OF HIGHWAYS
222 South Sixth Street, P.O. Box 2107
Grand Junction, Colorado 81502-2107
(303) 248-7208

January 22, 1986

Mr. Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson Street
Craig, CO 81525

Dear Mr. Goodenow:

The Colorado Department of Highways' District III office has reviewed the Draft Jones Creek Environmental Impact Statement (EIS) and has the following comments.

7-1 The development of a large production coal mine which produces ten million tons of coal per year would have a significant and adverse impact on S.H. 13, if coal were hauled on S.H. 13 to either Craig or Rifle. Therefore, we request that permits for development of the James Creek coal mine specifically prohibit the permanent or temporary trucking of coal on S.H. 13 without providing appropriate mitigation measures to maintain a safe highway facility. These measures would include the construction of climbing lanes on grades steeper than 2.5 percent and the channelization of major mine access intersections that tie directly into S.H. 13. In addition, if substantial roadway surface or subsurface damage occurs after the first year of repetitive coal haul, the mine operator would be required to participate in the restabilization and repaving of damaged sections of S.H. 13.

7-2 All existing and new mine access points onto S.H. 13 will require the submittal of Colorado Division of Highways' access permit applications due to the significant increases in production levels and traffic volumes at the mine site. The access permit submittal and review will be required regardless of the method of coal transport utilized.

It should be noted that the requested mitigation will not be required if coal is shipped to available markets with the use of unit trains on the "anticipated" rail extensions, as proposed in this Draft EIS.

We appreciate the opportunity to review and comment on the Draft EIS at this time. We also request a copy of the Final EIS for this project when it is available for public review.

Very truly yours,

R. P. MOSTON
DISTRICT ENGINEER

Laurence R. Abbott
By LAURENCE R. ABBOTT
DISTRICT ENVIRONMENTAL MANAGER

LRA/jme
cc: Siebels
Chocol
Moston/Perske
File

6-1 The analysis presents that which can reasonably be projected at this time. The analysis will be revisited during the permitting process, prior to any possible development. BLM recognizes the importance of minimizing increases of total dissolved solids where possible.

6-2 Because resolution of this issue lies between the owner of the water rights and the coal company, the discussion requested is beyond the scope of this EIS.

7-1 Mitigation measures required to maintain a safe highway were not addressed in this leasing EIS since Consol would have to obtain all approvals from CMLRD, OSMRE and Colorado Division of Highways before any actual mine development. In addition, 50 percent of the royalty monies collected by the federal government go to states for use by states for highways, public facilities, schools, and other public purposes.

7-2 Thank you for the information.

8

United States Department of the Interior
BUREAU OF MINES
P. O. BOX 25086
BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225
Intermountain Field Operations Center

LAND MGMT.
CRAIG, CO 81625
'85 JAN -6 12

January 31, 1986

Memorandum

To: Greg Goodenow, Project Manager, Bureau of Land Management,
455 Emerson Street, Craig, Colorado 81625

From: Chief, Intermountain Field Operations Center

Subject: Review of Draft Environmental Impact Statement for James Creek Coal Preference Right Lease Application

Personnel of the Intermountian Field Operations Center, Bureau of Mines, have reviewed the draft environmental statement for the James Creek Coal PRLA as you requested. The document discusses several alternatives pertaining to the leasing and subsequent development of a coal deposit near Meeker, Colorado.

8-1 The Bureau of Mines interest pertains to mineral resources and mineral-producing facilities and how they would be impacted by granting of a lease. Mineral resources of the lease area are adequately discussed in the document (pp. 55-60).

We can appreciate the time and effort spent in the preparation of the draft environmental impact statement; we have no objections to the document as written. Thank you for the opportunity to comment.

W Cochran
William Cochran

9

United States Department of the Interior
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:

LAND MGMT.
CRAIG, CO 81625
'86 JAN 24 11 11

L7619 (RMR-PP)

JAN 31 1986

Memorandum

To: Project Manager, Bureau of Land Management, Craig District Office, Craig, Colorado

From: Associate Regional Director, Planning and Resource Preservation, Rocky Mountain Region

Subject: Draft Environmental Impact Statement, James Creek Coal (DES 85/52)

9-1 We have reviewed the subject document and have determined that the proposed action will have no effect on lands or programs administered by the National Park Service.

for Katherine Stevenson
Richard A. Strait

8-1 Thank you for commenting.

9-1 Thank you for commenting.

10

BOARD OF COUNTY COMMISSIONERS
RIO BLANCO COUNTY COURTHOUSE
POST OFFICE BOX 599
MEEKER, COLORADO 81641
303 878-5001

January 27, 1986

Bureau of Land Management
Greg Goodenon, Project Manager
455 Emerson Street
Craig Colorado 81625

RE: Draft James Creek Environmental Impact Statement

Dear Mr. Goodenon,

10-1 The draft James Creek Environmental Impact Statement is the first EIS we have seen since the Bureau of Land Management adopted the approach of incorporating overall market factors into the EIS process. This change in approach was designed to avoid the misleading data that results from totaling the impacts of all proposed development, without regard to the ability of the market to support such development. We applaud this notion and appreciate the effort to produce more realistic and applicable impact projections.

We are supportive of the appropriate development of natural resources within Rio Blanco County. One of the fundamental requirements of the management of such growth, is the development of good basic data. Data that an EIS can provide.

We believe though, that the James Creek EIS makes some errors of fact and some errors of logic from the local perspective. Principally these logical errors involve the evaluation of impacts, the estimation of impacts and the utilization of base data. Attached are our comments which describe our concern and delineate what we believe to be the factual errors. We have confined ours comments to the Chapter 3 sections titled: Social Environment and Economics.

James Creek Environmental Impact Statement
Page 2

We would be happy to discuss our concerns with you further. If you wish more information, or if we can be of further assistance, please contact us, or Reid Haughey, Development Administrator, at your convenience.

Sincerely,

THE RIO BLANCO BOARD OF COUNTY COMMISSIONERS

Edward Coryell
C. Edward Coryell, Chairman

CEC:RH:rcc

COMMENTS ON DRAFT JAMES CREEK ENVIRONMENTAL IMPACT STATEMENT
BY
RIO BLANCO COUNTY BOARD OF COUNTY COMMISSIONERS
JANUARY 22, 1986

Chapter 3 - Social Environment

10-2 1. Paragraph two on page 78, column one states, "The Community began to believe that energy development & town growth would actually happen when C-a and C-b reduced the work force." It is unclear what this means.

10-3 2. Paragraph four in the same column discussed the financial status of Meeker. The oil shale trust fund noted is in fact the County Capital Improvements Trust Fund, administered by Rio Blanco County. The Town of Meeker does not have a healthy interest bearing surplus that is unencumbered. The information as presented paints a overly bright picture of the health of public sector in the Meeker community and does not address the "health" of the other providers of public services in Meeker. For example, the school system would be significantly impacted by the development of this project. This district and others are experiencing some difficulties at this time.

10-4 3. The first paragraph in column two, of the same page, makes the generalization that adequate facilities are available for substantial new growth. This is true of some, but not all public sector facilities. Closer analysis is required before such statements can be made.

10-5 This section on social environment concludes that population growth impacts would be of low to moderate significance and that the communities of Meeker and Craig are receptive to growth.

It is arguable whether the community of Meeker is in favor of growth. It is less arguable that the community is in favor of stabilizing its population and base economy.

10-6 Categorizing growth impacts as low to moderate for the community of Meeker is very time dependent. This assessment is based on current vacancy rates a community "good". As the community adjusts to it's economic shrinkage, its ability to service and absorb additional population contracts proportionally, with the possible exception of some public sector infrastructure.

10-7 The conclusions of the Social Environment section are time sensitive and may apply currently. Elsewhere in the draft EIS there is discussion of the difficulty in predicting the timing of development. Given this difficulty, it is questionable whether time sensitive conclusions which will be accurate at the time of development can be drawn.

Chapter 3 - Economics

10-8 1. Within this section of the EIS, the impacts of this project is compared primarily to the No Action/No Development alternative. Within the No Action/No Development alternative is the assumption (Economic Assumption #2), that regional coal production will increase to 20 million tons per year by some unspecified date. Therefore, since technologies employed by this project are assumed to be more efficient than older technologies already employed by existing mines, the impacts of this project are less than the No Action/No Development alternative. Within the structure of this analysis lies a logical flaw.

10-9 Economic Assumption #1 discusses current trends and conditions. It asserts that 10 million tons per day of coal will be produced in the region by 1984. This is offered as the status quo. The purpose of an EIS is, (in part), to investigate changes from the status quo.

10-10 Although the information supplied, which analysis the impacts of this project's proposed production levels primarily against the No Action/No Development alternative and Economic Assumption #2 is valuable, the focus of this analysis would be more beneficial if it were a comparison of current conditions to changed conditions as a result of development. The No Action/No Development alternative should not include Economic Assumption #2 but Economic Assumption #1.

10-11 To not focus on changed conditions from current conditions is to abdicate the purpose of the EIS. Focusing the analysis on change resulting from this project compared to change resulting from other projects does not address the issues.

10-12 The notion of justifying this analysis by utilizing projections of the ability of the market to support development is misapplied here. Such market projections can be employed to assess the viability of a proposal or the cumulative impacts of multiple proposals, but not as the baseline for calculations the impacts of a particular proposal.

10-13 Possibly a logical way to incorporate this notion of marketability is to discuss the market feasibility separately from the project specific impacts. The pertinent bit of information which comes from the economic analysis conducted in this manner is that this project will have to capture essentially all the 1984 market to develop to it's anticipated production levels.

10-14 The impacts of such production should be primarily compared to current conditions though.

10-15 2. At the bottom of the second column on page 78, the reader is instructed that impacts from the construction of this project and impacts from full production will be compared to current trends and conditions. But later on in the document (the final sentence on page 79), we are told that 1991 will be the comparisun year. No significant discussion of construction impacts follows, nor does the reader know if 1991 is a full production year.

10-16 3. The final "bullet" in the first column on page 79 states that Moon Lake Power Plant Units 1 & 2 are in Rio Blanco County. There is no Moon Lake Power Plant. The proposed plant was abandoned in favor of the Bonanza Power Station, located in Bonanza, Utah. This plant, has been in construction for over three years, and is anticipated to commence operations this spring.

10-17 4. In this same last paragraph on page 79 the reader is informed that there will be a regional construction force of 300 in 1988 and 350 in 1989 from this project. Also we are advised that these workers represent 50% to 60% of the projects listed. Listed where" No other projects are listed. If these other projects are coal projects, then is it reasonable to assume their existence, given that this project will fill the available market? This area may be a logical place to employ the market factors introduced into the EIS analysis and is an area that requires analysis, not just cursory mention. Construction workforces historically caused the greatest financial drain on local governments.

10-18 5. Agriculture is underrated economically. As a portion of the economic base, it arguably represents the greatest primary economic component other than mining. Elsewhere in this document, the problems associated with maintaining a base economy "under the Boom-Bust cycles that have characterized the region's energy/mining development" are discussed. As agriculture represents the most significant defense against a "hollow" energy development economy, its importance as such should be reflected in the analysis.

10-19 6. The third to last paragraph in column 2, of page 79 states that "reasonable base line projections cannot be made as far as 2000." Yet the following tables attempt to quantity such baseline projections as part of the analysis.

10-20 7. In the last paragraph of the second column on page 79, the assertion is made that "impacts would not be as large for the region as otherwise anticipated. Out migration or unemployment for . . . Rio Blanco County. . . would be slowed." This is again a time sensitive assertion, much like those made in the social environment section.

10-21 8. Vacancy rates are discussed in the last paragraph of the first column on page 84. The statement is made that communities could absorb 9 to 27 percent without significant impacts. Again, this is a time sensitive assertion which, even if correct, contains the pitfalls noted above.

10-22 From the local perspective, the utility of the analysis conducted by the EIS lies in its ability to estimate changes from present conditions during the construction and operations phases. Not in changes relative to certain assumptions about economic growth which may or may not occur without the studied project. Time sensitive assumptions about a community's ability to absorb or adjust to such change is the purview of the community to determine. The notion of incorporating the projected capacity of the market to support a given project into the EIS is useful when employed as a separate analysis aimed at articulating a probably of the project's development or the cumulative impacts of multiple projects.

10-1 Thank you.

10-2 thru 10-7
Because the social section restated information contained elsewhere (it was not necessary to maintain a valid analysis and resulted in confusion to the public), it has been deleted. The Economics section and its discussions of infrastructure have been retained.

10-8 The figure 2-1 and figure 2-2 time frames are identified. Even with improved technology the increase in tonnage would be distributed to the existing mines; each operating at a smaller economic scale than would Consol, therefore, the analysis is appropriate.

10-9 Impacts that occur as a result of other actions and to which this project does not contribute are beyond the proper scope of this EIS, and are not addressed. The purpose of NEPA (and CEQ regulations) is to identify impacts which may result from a major federal action, not unrelated charges from the status quo. We have included the information, however, so that a logical comparison can be made against existing conditions.

10-10 The purpose of this document is to analyze impacts resulting from possible leasing and subsequent development resulting from the PRLA. It appropriately is the responsibility of local government to assess what course of action is needed to accommodate future conditions. We have provided information and current trends and conditions in this document to assist local governments in their effort.

10-11 See the response to 10-9 and 10-10.

10-12 As your comment states, our methodology is appropriate for assessing the cumulative impacts and multiple proposals, and projects. This is what we have done. We do not intend to imply that the proposed project is viable or not viable in this EIS. We are simply identifying the impacts that may occur should the project actually be developed.

10-13 We discussed market feasibility in Chapter 2 separately from project specific impacts. We refer the reader to the beginning of Chapter 2. Your assessment of the amount of the coal market that Consol would have to capture is correct.

10-14 See the responses to 10-9 and 10-10.

10-15 Clarifications have been made. Please see tables 3-17 through 3-25. Information is presented to the reader, so the reader can identify and compare impacts from several scenarios.

10-16 The text has been corrected. Impacts from Bonanza 1 and 2 do occur in Rio Blanco County. The analysis is correct, in that the Bonanza Power Station was in fact what was analyzed.

10-17 The text has been clarified.

10-18 The data is from the Bureau of Economic Analysis through the Colorado Division of Local Government. We feel the data is accurate and adequate, and that the analysis is correct. We recognize the difference in opinion.

10-19 Although we are using the best methodology we know of, projecting the future involves a great deal of uncertainty. We acknowledge the possible inaccuracies. The text has been clarified.

10-20 The paragraph deals with just the construction force. The text has been clarified. Please refer to the response to 10-21.

10-21 The ability of communities to absorb growth beyond the vacancy rate is time dependent. No impacts are anticipated from people moving into vacant housing, nor are impacts from filling vacant housing time related.

10-22 We realize the purposes of the Bureau of Land Management in our compliance with NEPA may not completely coincide with the objectives and needs of local government. The analysis presented here does provide the cumulative impacts of multiple projects, which includes this project. As such the analysis is appropriate.

11

February 10, 1986

Bureau of Land Management
Greg Goodenow, Project Manager
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

I would like to comment on the draft EIS for the James Creek Coal preference right lease application. I comment as a concerned resident of Craig in Northwest Colorado and as a United States citizen in what I view to be the best interests of my government agency, the BLM.

My first comment has to do with the prediction of coal production in Northwest Colorado on pages 12 and 13 of the draft EIS. Actual coal production in Moffat, Rio Blanco, and Routt Counties in Northwest Colorado was 11,375,498 tons in 1984 and 11,739,882 tons in 1985. These figures are published by the Colorado Division of Mines. The EIS prediction was under 10 million tons in 1984 and 9.2 million tons in 1985. This is a substantial difference of 2.5 million tons in 1985. Furthermore, 10.6 million tons were mined in 1985 under long term contracts. This is 91% of the total coal sales tied up in long term sales contracts.

I do believe the 1990 - 2000 estimates in the EIS to be accurate. The additional tonnages will come, however, from escalating tonnage requirements under long term contracts. The most notable of these will be in the Deserado Mine and Colowyo Coal Company's contract with Colorado Ute. However, if the same long term to spot ratio holds in 1991, 13.7 million tons will be under long term contract by then, and only 1.3 million tons in spot coal sales will be available.

The growth planned between 1991 - 1995 is 1 million tons, which when added to the 1.3 million tons of spot sales is 2.3 million tons, which any new company or existing coal companies could sell. Existing coal companies in Northwest Colorado have existing excess capacity which would prevent a new company from capturing all of the 2.3 million tons of spot business. The BLM's own projections suggest that the projections by Consol are impossible to reach. They are not just overly optimistic or improbable. They simply cannot happen under present conditions. Any one company could not, under BLM's projections, capture 10 million tons of Northwest Colorado's coal market until 2005.

My next comment concerns the diligent development of the lease. The mine is scheduled to commence operation in 1991. The first 4½ years of operation is scheduled to be mined off of the PRLA area on another federal lease held by Consol. The adjacent Federal Lease #C093713 was issued in 1967 and 19 years have elapsed without any coal being mined on this lease.

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Page 2

11-4 cont. If the PRLA was issued in 1986, the mining company would be required to mine 1% of the 280 million recoverable tons by 1996. Even under what I considered above to be an impossible production schedule, it is questionable at best as to whether 2.8 million tons would be mined by 1996. This would then require a Logical Mining Unit (LMU) to be established with the existing federal lease. At a production level less than 10 million tons per year or a delayed start-up, the LMU could not be mined within the 40 year federal law time limit.

11-5 The BLM has a major problem nationwide with the due diligence requirement. It does not seem logical to grant a lease which does not stand a chance of meeting due diligence requirements. If past practice is any indication and BLM's production projections are even half right, in another 19 years the new lease will not be in production.

11-6 My next comment concerns the transportation proposal in the EIS. A major presumption is that the rail line will ". . . tie in with the existing line which serves Colowyo Coal Company (Map 2-4)". That rail line is not owned by any railroad. It is owned by Colowyo Coal Company. It is no accident that this is a privately owned spur. This coal company which operates the largest mine in the State of Colorado, has spent several million dollars to insure its transportation system retains a competitive advantage. It will not give up that competitive advantage to another coal producer in any constrained market environment. As long as a coal company has over 30 years of recoverable coal reserves, it will protect the marketability of those reserves. Even if a tie into the rail line at Axial was possible, the rail haulage would be on the very end of the D&RGW line. This would likely result in the most expensive transportation cost in Northwest Colorado.

11-7 The installation of a rail line all the way to the D&RGW line 4 miles north of Hamilton would be cost prohibitive and the line would have to cross surface owned by other coal operators. Northern Coal Company was forced to truck their coal to the Wilson Loadout. This would be cost prohibitive and not practical at 10 million tons per year. The 250,000 round trip truckloads per year would be over the highway traffic volume design capacity and create exensive wear on the highway with the 40 ton loads.

11-8 My next comment concerns the impact of displaced workers and population relocation. If Consol proceeds along what I described as their impossible production scenario which it proposes, it would employ 900 workers in Rio Blanco County. But if BLM's total Northwest Colorado coal production is correct, the 12 operating mines in Northwest Colorado would be reduced to only two. That would displace over 1,500 workers and many more services and support businesses. This may be a boom to Meeker, and their capacity to handle such a boom would be tested. If this happened, it would be disastrous for Craig, Hayden, Steamboat Springs, and Oak Creek.

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In summary, the PRLA applicant must demonstrate that the coal property can be developed economically in order for BLM to issue the lease. Two major portions of this economical development are missing or at best inadequate. Those two issues are marketability and transportation. How can Consol market 10 million tons per year if only 16 million tons per year are sold from the region and 13.7 million tons are already committed under long term contracts? Without an agreement with the owner of the rail system, Consol cannot show that they can economically mine and ship 10 million tons per year. Also, the company is headed for due diligence problems if this lease is granted.

I believe that in 30 years or so, this property will be economically feasible. If elk migration patterns change by then the BLM could have 666 million tons instead of 190 million tons. The market will then allow this coal to be mined, and provide a return on investment adequate to finance a transportation system which will allow the coal to be shipped. With no up front money, Consol has no risk in tying up this lease for 10 years or more and then walking away when the inevitable occurs; no market, and therefore, no due diligence. I believe it would be in the best interests of the BLM to foresee that situation and therefore, reject this PRLA.

Sincerely,

Rod Lawrence

Rod Lawrence
762 Park Court
Craig, Colorado 81625
824-9640

12

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
ONE DENVER PLACE — 999 18TH STREET — SUITE 1300
DENVER, COLORADO 80202-2413

FEB 20 1986

Ref: 8PM-EA

Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson Street
Craig, Colorado 81626

Re: James Creek Coal Preference Right
Lease Application DEIS

Dear Mr. Goodenow:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, the Region VIII office of the Environmental Protection Agency (EPA) has completed its review of the James Creek Coal Preference Right Lease Application Draft Environmental Impact Statement (DEIS). We offer the following general comments and the attached specific comments and concerns for your consideration in preparation of the final EIS.

12-1 EPA's primary concerns are with significant environmental impacts related to water quality. The DEIS does not contain sufficient information on mitigation of impacts which may violate water quality standards requirements including antidegradation provisions. **12-2** In addition, there is insufficient information on potential salinity increases to both surface and ground water during mining operations as well as post-mining contributions. These increases need to be quantified and evaluated in relation to the Colorado River Salinity Control Act goals.

12-3 The DEIS projects significant wetlands-riparian complex impacts from aquifer disruption, particularly in the James Creek headwaters. This action, as well as proposed overburden storage and a transportation corridor in the James Creek drainage, need to be evaluated subject to Section 404 permit requirements.

We have rated this DEIS, EO-2. This means that we have environmental objections to portions of the action as proposed; in particular, those impacts to water quality and loss of wetlands. Also the document does not contain **12-4** sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment. A copy of the rating system is attached for your information. EPA has identified corrective measures which would assist in evaluation and avoidance of environmental impacts. We will work with the BLM to further reduce these impacts. If you have any questions concerning these comments, please contact Mike Hammer of my staff at (303) 293-1710 or FTS 564-1710.

Sincerely,

Dale Vodehnal

Dale Vodehnal, Chief
Environmental Assessment Branch

cc: William Dickerson, A-104, H.Q.
Kerry Clough, ARA, 8PM

EPA DETAILED COMMENTS ON JAMES CREEK COAL PREFERENCE RIGHT LEASE APPLICATION DEIS

12-5 The section under Water Resources refers to a "modified buffer zone . . . that would allow some activities provided Consol could demonstrate to BLM that these activities would not significantly affect the water quality . . .". In making such a demonstration, the antidegradation requirements (40 CFR 131.12, in EPA's Water Quality Standards Water Quality Standards (WQS)) must be fully complied with. A copy of these regulations as well as a copy of the document "Questions and Answers on: Antidegradation" are enclosed for your information.

12-6 This section also states that "BLM would require measures to reduce the impact to quality and quantity of water located on and near the PRLA and Lease C-093713". EPA WQS require that the water quality standards of downstream waters must be attained (40 CFR 131.10 (b)). Water quality standards consist of both beneficial uses and criteria necessary to protect such uses, as well as antidegradation provisions (40 CFR 131.3(1) and 131.6).

12-7 Further discussion page 23 states that mitigation measures will include "minimizing impacts on the main James Creek channel resulting from the overburden stockpile." Map 2-1, Consol's Initial Proposal on p. 15, shows the overburden stockpile along and in approximately four miles of stream channel. Map 2-3, Consol's Current Proposal on p. 18, and the discussion on p. 48, shows the overburden stockpile along and in more that one mile of stream channel; the remaining three to four miles of stream corridor are identified as a transportation corridor. The discussion on p. 48 also states that overburden stockpiles will be placed in James Creek headwaters. Placement of the overburden stockpile in the stream channel and adjacent wetland areas must be avoided. The DEIS needs to discuss whether a Corps of Engineers (COE) Section 404 Dredge and Fill Permit will be necessary.

12-8 Discussion under Surface Water-Proposed Action and Preferred Alternative on p. 26 and p. 41-53, predicts that total dissolved solids (TDS) values will increase both on-site and off-site from a present value of 800 mg/l to 2000-3900 mg/l. (Note: The TDS values on Table S-1, p. vi, are not consistant with these increased values.) The EIS needs to show that this increase in TDS is consistant with the goals for the Upper Colorado River Basin set by the Colorado River Basin Salinity Control Act (PL 93-320, as amended by PL 98-569). This law should be included in Appendix B, "Laws and Agencies Mitigating Coal-Related Impacts". The project impacts, in relation to other salinity control efforts occuring in the basin, must be evaluated and discussed. At a minimum the additional salinity contribution from the project to the Colorado River system needs to be disclosed. In addition, the impacts of increased salinity on downstream uses needs to be discussed. Pages 40-42 indicates use for surface irrigation in downstream James Creek and Good Spring Creek areas. Again, 40 CFR 131.10(b) requires that downstream uses and water quality criteria be maintained.

12-9 On page 27 the discussion under Floodplains needs to show the projects consistancy with EO 11988, Floodplain Management. This EO should be included in Appendix B, Laws and Agencies Mitigating Coal-Related Impacts.

12-10 The DEIS on p. 48 states that with the exception of 5 CCR 1002-11, the State has not adopted a specific quantitative standard regarding TDS. However, antidegradation requirements found in both Federal and State water quality standards are applicable.

12-11 The Groundwater discussion on pages 48-54 and elsewhere in the DEIS acknowledge disruption of aquifers and increased TDS concentrations in the study area groundwater. The EIS needs to quantify the TDS increases from leachate into stream channels and discuss potential effects on area wells, drinking water sources, and aquatic life.

12-12 As the replaced spoils aquifer recharges and salt loads increase groundwater in and around the project area will be further degraded. The EIS needs to disclose the potential effects of these impacts on area water quality and quantify post-mining salinity contributions to the Colorado River Basin.

12-13 The DEIS does not evaluate the potential for heavy metals contributions to ground and surface waters from spoils leaching. Potential values need to be determined and compared with current State water quality standards.

12-14 Page 61, under Vegetation states that approximately 152 acres of wetland meadows could be lost if a rail line (not covered by the DEIS, though probably needed to transport the coal from the project area) is built along Good Spring Creek. In addition, 28 acres of wetlands and meadows could be lost through road construction. The DEIS further acknowledges the loss of wetlands due to mining of the headwaters of James Creek. We were unable to find an acre value for this projected loss. EPA recommends evaluation of the headwaters area as a mining avoidance area. Alteration of ground water/surface water regimes could result in the loss of significant portions of the wetland-riparian complex. While the mitigation measures listed in Appendix C relate to replacement of in-kind habitat values, it is not clear if this will be on an acre-for-acre basis. Additionally, EO 11990 requires the protection of wetlands for all values not just habitat. The EIS needs to discuss how the loss of these wetlands and alteration of the ground water/surface water regimes at the James Creek headwaters will affect downstream water quality. It should also discuss alternatives which avoid wetland impacts. Appendix B should include EO 11990 under Laws and Agencies Mitigating Coal-Related Impacts.

12-15 The discussion under Fish, on p. 70-71, states that under the preferred alternative, "lowering of water quantity or quality would make James Creek unsuitable for fish. This would not be significant because no major populations are known to exist." However, this stream is classified by the

12-15 cont. State as Cold Water Aquatic Life, Class II (DEIS, p. 41). The DEIS also states that James Creek can support several species of game and nongame fish (p. 70). Thus, aquatic life, including fish, is an attainable and existing beneficial use and must be fully maintained and protected (40 CFR 131.12 (a)(1)). EPA guidance further states that "species that are in the water body ... must be protected, even if not prevalent in number or importance." Activity cannot be allowed that would render the water quality "unfit for maintaining the use." (Questions and Answers on: Antidegradation, USEPA, August 1985, p. 3). The action as proposed may be inconsistant with EPA regulations as cited.

12-16 Page 114, Laws and Agencies Mitigating Coal-Related Impacts. Although the Clean Water Act is listed, the "Purposes" and "Major Relevance" focus on point source discharge limitations. Other areas of the Act are also applicable, and need to be included and discussed in the EIS: (1) Water Quality standards, including antidegradation provisions, must be complied with by nonpoint sources as well as point sources (CWA, Section 303(c); 40 CFR 131 (Water Quality Standards regulations); Questions and Answers on: Antidegradation, USEPA, August 1985, especially questions 8, 14, and 17). (2) Section 404 permitting requirements must be complied with.

13

COLORADO NATIVE PLANT SOCIETY
P.O. BOX 200 • FORT COLLINS, COLORADO 80522
...dedicated to the appreciation and preservation
of the Colorado native flora

February 24, 1986

Mr. Greg Goodenow, Project Manager
Bureau of Land Management
Craig District Office
455 Emerson Street
Craig, CO 81625

Dear Mr. Goodenow:

Re: James Creek (Consol) PRLA EIS

The Colorado Native Plant Society has reviewed the James Creek Preference Right Lease Application EIS, and appreciates the opportunity to offer these comments.

13-1 We are aware of no Plant Species of Special Concern existing in the area in which surface mining is proposed, and we note that the EIS reports none. Understandably, CONPS, as a group concerned with preservation of Colorado's native flora, is not enthusiastic about destruction of 5,200 acres of vegetation; however, we recognize the need for some resource development. Although reclamation cannot recreate the original environment, it appears that the reclamation measures proposed in the Preferred Alternative are desirable. In particular, CONPS favors the inclusion of aspen reclamation standards as proposed in the Preferred Alternative.

Thank you for the opportunity of reviewing and commenting on this EIS.

Sincerely yours,

Susan S. Martin
Conservation Committee Chair

11-1 Northwest Colorado coal production figures were compiled from the State of Colorado Division of Mines monthly inspection report and from Colorado's Coal Industry, a paper prepared for the Colorado General Assembly by Diane Delaney (January, 1982). We have updated the production figures to reflect actual production tonnages for 1984, 1985, 1986, and 1987.

Subsequent regression calculations using the updated figures indicate our projections are still within the 16 to 20 million ton range.

11-2 We are not predicting who will capture this increased coal production. The EIS simply identifies what impacts would occur if Consol captures all or any part of the increase through development of this PRLA as they have proposed. Actual allocation will be based upon free market competition. This analysis is not intended to determine the validity of Consol's proposal.

11-3 See the response to comment 11-2.

11-4 and 11-5
The BLM is obligated by law to process the application for a preference right lease. If the applicant demonstrates commercial quantities of coal, recognizing the cost of mining, reclamation, and complying with all the terms and conditions of the lease, the applicant is entitled to a lease. Once a lease is issued, production in accordance with existing regulations must be achieved with ten years, or the lease becomes null and void. Please refer to the Purpose and Need Section in Chapter 1.

11-6 and 11-7
As discussed in Chapter 2, the rail scenario presented is speculative, but in order to identify possible potential impacts related to development of the PRLA, it has been included for analysis purposes. Consol anticipates that coal from this mine will be transported by rail, with a loadout facility located south of the Moffat/Rio Blanco County line. The fact that Colowyo constructed a rail line to the D & RGW line indicates that such an installation is feasible and is likely the most cost effective method for transporting coal mined in the James Creek Axial area. Some text clarifications have been made.

11-8 We make no suggestion about reducing the number of operating mines from 12 to 2. The Consol proposal assumes that they would capture the increased production and a portion of the existing production if the PRLA is developed. However, it is beyond the scope of the EIS to predict who will capture the increased production in the free market. The EIS is attempting to analyze what impacts may happen under all the various scenarios. Even if Consol captures an additional 10 million tons of coal per year, the remainder of the coal will still come from existing mines. Therefore, there would be no unemployment associated with the additional 10 million tons of coal. A more likely scenario is that Consol would capture less then 10 million tons per year but the impacts are largely the same. These concerns are discussed on page 25 "Other Production Levels".

11-9 and 11-10
These kinds of issues will be addressed to some degree in the final showing, not the EIS, as identified in 43 CFR 3400. Also see the response to 11-2.

12-1 and 12-2
We recognize that potential impacts from mining may occur. More information will be available during the permitting process. The information and analysis presented in the EIS, while adequate for a leasing decision, fall short of that needed to complete the permitting process which must occur prior to any development. To help explain the tiered leasing and permitting process, a discussion of this process has been added to Chapter 1 of the EIS. Also see the response to 12-8.

12-3 Section 404 permit requirements will be considered during the permitting process.

12-4 Impacts will not be fully assessed until the permitting process, when they can be based on an actual proposal for mine development, rather than a hypothetical scenario.

12-5 Thank you for the information.

12-6 Thank you for the information.

12-7 Please refer to response 12-3.

12-8 The table has been corrected. Any assessment, such as the one suggested, would be premature prior to an analysis identifying a more accurate quantification of the impacts, based on a definite development proposal. The Colorado River Basin salinity control form adopted a policy for implementation of the Colorado River Salinity Standards, through the NPDES Permit Program, on February 28, 1977. These standards state that the objective for discharges from industrial sources shall be a no-salt return policy whenever practicable. The determination of whether a spoil pile constitutes a point source and requires a NPDES permit is the responsibility of the State of Colorado, and EPA, and would be accomplished during the permitting process.

12-9 Executive Order 11988 has been included in Appendix B. Because of the preliminary and uncertain nature of the development scenario (see the discussion in Chapter 2, a discussion of consistency with the executive order has been deferred to the permitting process. The executive order was reviewed during the analysis process, and no conflicts were identified with the scenario presented.

12-10 We agree. The proposed lease would not release the lessee from any statutory or regulatory requirements. A discussion to clarify this has been included in Chapter 1 of the Final EIS.

12-11 Please refer to response 12-2.

12-12 Please refer to response 12-2

12-13 Please refer to response 12-2.

12-14 Executive Order 1190 has been included in Appendix B. Because of the preliminary and uncertain nature of the development scenario (see the discussion in Chapter 2), a discussion of consistency with the executive order has been deferred to the permitting process. The proposed lease stipulations would not release the lessee from any statutory or regulatory requirements.

12-15 Thank you for your comment. Please refer to response 12-2.

12-16 Thank you for your comment. The table presented is not intended to be a complete listing of all the detailed requirements of the permitting process. It is intended to provide a general overview of applicable laws and regulations.

13-1 Thank you for commenting.

14

NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

February 27, 1986

Bureau of Land Management
Greg Goodenow, Project Manager
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

14-1 On February 8, 1983 and May 2, 1983, our organizations informed the Department of the Interior and the Bureau of Land Management that Preference Right Lease Applications were being processed in violation of the National Environmental Policy Act and U.S. District Court Judge June L. Green's Order of June 30, 1978 in Natural Resources Defense Council, Inc. v. Berklund, (Civil Action No. 75-0313, U.S. Dist Ct., Dist. of Columbia.) Copies of these letters are attached and incorporated herein.

14-2 As you know, we are having continuing discussions with the Department of the Interior and the Department of Justice regarding the concerns outlined in these letters. During the pendancy of these discussions, we object to the Bureau of Land Management taking any further action on the James Creek Coal PRLA (C-0126998).

14-3 We have reviewed the draft EIS on this PRLA and have concluded that it fails to comply with the National Environmental Policy Act and the above mentioned Court Order. It does not resolve the issues detailed in our previous communications with the Department of the Interior, despite the fact that the document is called an Environmental Impact Statement rather than an Environmental Assessment.

14-4 We are particularly concerned with the document's examination of the potential impacts of development of this PRLA to ground and surface water, wildlife, and soils. For each of these potentially impacted resources the data upon which the draft EIS is based appears to be weak or questionable, the mitigation proposed is speculative with key decisions being deferred for future resolution, and no analysis of alternative mitigation measures appears to have been conducted.

14-5 For example, the document's analysis of impacts to critical elk habitat are based upon data obtained during atypically severe 1983-84 winter. The elk habitat mitigation plan relies upon an acre-for-acre replacement ratio, which appears dramatically low based upon recent studies conducted by the Wyoming Fish and Game Department. The mitigation plan also relies upon the unsupported assumption that suitable land exists nearby and that the present owner(s) will be willing to sell or lease such land.

Febaruary 27, 1986
Page 2.

14-6 Further, the document does not demonstrate that any analysis has been conducted of alternative mitigation techniques for the potentially significant impacts to elk habitat. Instead, it relies almost exclusively upon one proposal.

14-7 We also note that the document does not provide an adequate analysis for purposes of conducting the commercial quantities test required of a PRLA. In several instances, such as impacts to paleontological and cultural resources, the document defers collection of significant data. The inventory data for these resources must be available as part of the EIS. Moreover, without such data potential impacts cannot be determined and commercial quanitities cannot be determined.

14-8 For all of the proposed mitigation, no costs are developed which would allow the public to participate in the critical questions surrounding issuance of a federal coal lease.

14-9 Finally, the proposed lease stipulations do not appear to provide for effective enforcement of the proposed mitigation in the document. For example, while the entire analysis of potential impacts to elk habitat assumes that large portions of the study area will not be mined, the proposed lease stipulation could allow mining of these areas. Either the stipulation must be revised to reflect the analysis of the EIS, or the analysis of the EIS must incorporate an analysis of full development of these lands. We also question why the BLM has not considered the alternative of excluding lands which it considers unsuitable for mining from any lease which is subsequently issued.

14-10 The draft EIS also does not include an analysis of potential cumulative impacts upon the environment. This particular lease poses unique cumulative impact questions, particularly to water and wildlife resources. Yet no analysis of cumulative impacts is included.

14-11 In addition to the above concerns, it appears that the BLM has violated its regulatory obligations to apply the unsuitability criteria to these lands during preparation of the White River Resource Area Management Framework Plan. Nor is it clear whether this document is an amendment to that Plan, or whether subsequent actions will be required to apply the unsuitability criteria to these lands. These are critical questions for many of the assumptions made in this analysis.

14-12 The BLM also does not take into consideration the diligence status of the federal leases involved in the study area. It appears that these leases may be subject to enforcement actions and/or cancellation due to the failure on the part of the Consolidation Coal Company to diligently develop these leases. These events would have a major bearing upon the environmental analysis, and upon any commercial quantities determination.

February 27, 1986
Page 3.

While our organizations wished to inform you of our concerns about this draft EIS, we wish to re-iterate our objections to the BLM's taking any further action on this document or the PRLA at this time. **14-13** We believe that the comment period on this draft EIS must be extended until at least 30 days after our current discussions with the Department of the Interior and the Department of Justice are completed. Based upon our recent discussions with the Department of the Interior, we understand that our detailed comments on the draft EIS will be accepted at such a future date.

Sincerely,

Karl Gawell
National Wildlife
Federation

Johanna Wald
Natural Resources Defense
Council

Enclosures: 2

cc: Assistant Secretary Griles

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February 8, 1983

Mr. Robert L. Burford, Director
Bureau of Land Management
18th and "C" Streets, N.W.
Washington, D.C. 20240

Dear Mr. Burford:

As you know, the Natural Resources Defense Council, Inc. (NRDC) and the National Wildlife Federation have long been concerned about the handling of preference right lease applications (PRLAs). As you may also be aware, both organizations have recently been reviewing numerous documents involving PRLAs provided to us by state Bureau of Land Management (BLM) offices. Based on our review to date, we have reached the conclusion that the BLM is making a number of serious errors in its processing of PRLAs, particularly in its attempts to comply with the relevant requirements of the National Environmental Policy Act (NEPA). We are writing to inform you of the errors we have identified and to urge you to halt the further processing of all PRLAs until you are able to develop a program that clearly remedies these problems.

Our review indicates that the BLM is failing to prepare environmental impact statements (EISs) in circumstances where issuance of PRLAs would be major federal actions significantly affecting the environment. In many cases, the environmental assessments (EAs) that have instead been prepared clearly demonstrate that NEPA's threshold criteria for requiring EIS preparation are met. In many other cases, the contents of the EAs that have been prepared suffer from a variety of inadequacies. These include inaccurate and incomplete descriptions of environmental impacts; ill-defined and insufficient proposals for mitigation measures; unduly limited discussions of alternatives to the proposed action; superficial recommendations for lease terms; and inadequate opportunities for public comment.

For example, in most cases, discussions of project alternatives are limited to "no action" and "lease issuance," with no consideration of delay, lease exchange, lease cancellation or withdrawal. In many of the EAs, the recommendations for lease terms consist simply of a reference to the relevant statute or regulation. In some cases, the descriptions of environmental impacts fail to address socioeconomic impacts and reclaimability.

In general, the EAs do not contain the information needed to make the commercial quantities determination required by the Mineral Leasing Act and NEPA. Indeed, none of the EAs contain estimates of the cost of compliance with lease terms, as is necessary in order to make the commercial quantities showing.

Finally, our review suggests that the BLM is failing to determine the validity of the prospecting permits on which the PRLAs were based, including those in areas long recognized for their coal potential, where evidence suggests that the permits were improperly granted. Certainly, none of the documents that we have reviewed examine the validity of the permits involved.

It is clear from our review of the environmental analyses and from our conversations with BLM staff that the BLM has no comprehensive program for administering PRLAs in general or, more specifically, for conducting the environmental review required by NEPA. While we intend to supply further details regarding the problems outlined here in the near future, the evidence we have compiled clearly demonstrates the need for such a program. As you may recall, the preamble to the Interior Department's new coal leasing regulations acknowledged the need to develop procedures for the handling of PRLAs. See 47 Fed. Reg. 33114, 33126 (July 30, 1982). Consequently, we strongly recommend that you halt the processing of PRLAs until a systematic method has been established for evaluating the validity of the prospecting permits, performing the requisite environmental analysis, and determining whether the statutory prerequisites for lease issuance have been met. Given the current state of the coal market, the hasty disposition of PRLAs is no longer desirable for the government or, undoubtedly, to the applicants themselves.

In closing, we wish to express our appreciation for the cooperation we have received from the state offices in sending

the documents requested thus far. We request that in the future the BLM send us regularly all available documents pertaining to the processing of PRLAs.

Very truly yours,

Norman L. Dean
Norman L. Dean

Laura B. King
Laura B. King

Karl Gawell
Karl Gawell
NATIONAL WILDLIFE FEDERATION

Johanna H. Wald
Johanna H. Wald
NATURAL RESOURCES DEFENSE COUNCIL, INC.

cc: George C. Francis
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May 2, 1983

James G. Watt, Secretary
U.S. Department of the Interior
18th and C Streets, N.W.
Washington, DC 20240

Robert F. Burford, Director
Bureau of Land Management
U.S. Department of the Interior
18th and C Streets, N.W.
Washington, DC 20240

Re: Natural Resources Defense Council, Inc. v. Berklund, (Civil Action No. 75-0313, U.S. Dist. Ct., Dist. of Columbia)

Gentlemen:

You have been advised by my clients, the Natural Resources Defense Council and the Environmental Defense Fund, and by the National Wildlife Federation of serious, widespread violations of law in the Bureau of Land Management's (BLM) current review of preference right lease applications (PRLAs) and its proposed issuance of such coal leases.

The violations are in direct and apparent willful disobedience of U.S. District Judge June L. Green's Order of June 30, 1978, in the above-captioned action (copy attached), which specifically enjoined the Secretary from issuing preference right coal leases, that constitute major federal action and significantly affect the environment, "unless he first prepares an appropriate Environmental Impact Statement (EIS)." NRDC v. Berklund, 458 F. Supp. 925, 928-29 (D.D.C. 1978); aff'd, 609 F.2d 553, 555 n.3 (D.C. Cir. 1979).

As outlined in our February 8 letter and as further detailed here, the current PRLA program wholly contravenes Judge Green's Order. My clients are more than willing to meet with you and discuss constructive steps leading to compliance with the Order. However, given the imminence of these leases, unless I hear from your representatives before May 13, 1983, I am instructed to return to Court to enforce the Order through appropriate contempt proceedings against you.

The EISs ordered by the District Court are no mere formalities; they are critical to the decisions you are required by Congress to make. The preference right coal leasing program has always been a very narrow exception to the Congressional policy of planned, competitive allocation of the public's coal resources. Mineral Leasing Act of 1920, 30 U.S.C. § 201 (Supp. V, 1981), as amended by the Federal Coal Leasing Amendments Act of 1975. Because Congress specifically requires that "commercial quantities" be found, before one of these exceptional, "preferential" leases can be issued (former 30 U.S.C. § 201(b)(1976)), the EIS has a unique role in this program. Until the Secretary knows, from a site-specific analysis, what the environmental costs of development are, he cannot determine whether "commercial quantities" have been found. The EIS is the indispensable source of data and analysis for this "commercial quantities" determination.

Further Details of the Violations

Our February 8 letter promised further details of the legal violations encountered in the PRLA program. NRDC has reviewed 28 BLM environmental documents* covering some 130 PRLAs, involving over 310,000 acres in Colorado, Montana, New Mexico, Utah, and Wyoming, impacting 10 wilderness study areas, and aggregating over 6,000,000,000 tons of recoverable federal coal reserves.

The uniform pattern revealed by these documents is one designed, rather crudely, to evade the District Court's Order as follows:

1. Preparation of a short, superficial environmental assessment (EA) on the PRLA(s);

2. A finding that issuance of a lease to mine will have "no significant effect on the environment"; and

3. Complete failure to prepare the thorough environmental impact statement (EIS) contemplated by the Order.**

---

* The environmental documents were provided by BLM in response to NRDC's Freedom of Information Act requests filed November 18, 1982. We appreciate the thoroughness and consideration shown by the BLM Offices in their responses and assume we have been provided all environmental documents prepared to date.

** Ironically, in one case BLM has even been inconsistent with its evasion scheme by preparing an EIS on PRLAs. Savery (Wyo.-Colo.) Final EIS, W-0324034, W-0324035, W-0324036, W-0324038, W-0324041, W-0324042, C-3605, C-3606. Two other PRLAs were cursorily examined in an EIS which covered multiple other coal developments (Meeker (Colo.), C-0126997, C-0126999) and another 26 were examined non-site-specifically in the San Juan River (N.M.) Regional Coal Draft EIS.

In part, this arbitrary avoidance pattern by State and District BLM Offices is attributable to lack of central guidance from your offices. As
[footnote continued next page]

This is an egregious violation of BLM's obligation to prepare an EIS on each preference right lease project. It is simply too late in the day to argue that federal leasing of coal mining rights is not a "major Federal action significantly affecting the quality of the human environment." Section 102(2)(C), National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(2)(C).

Court cases have consistently held such coal leasing to be major federal action significantly affecting the environment. Kleppe v. Sierra Club, 427 U.S. 390, 399-400 (1976) (Interior "do[es] not dispute this requirement" of EISs for issuance of coal leases in the Northern Great Plains); Davis v. Morton, 469 F.2d 593, 596 (10th Cir. 1972); Cady v. Morton, 527 F.2d 786, 793 (9th Cir. 1975); NRDC v. Hughes, 437 F. Supp. 981 (D.D.C. 1977), as modified 454 F. Supp. 149 (D.D.C. 1978); and see National Indian Youth Council v. Watt, 664 F.2d 220, 223 (10th Cir. 1981) (two EISs for one coal lease).

Moreover, the Departments of the Interior and Justice have consistently told the courts this was their firm position:

> Clearly, the issuance of a federal coal lease of any substantial magnitude or in an environmentally sensitive area is a "major federal action significantly affecting the quality of the human environment," within the meaning of Section 102(2)(C) of NEPA, 42 U.S.C. 4332(2)(C).

Brief for the Federal Appellees at 32, NRDC v. Berklund, 609 F.2d 553 (D.C. Cir. 1980); accord, 609 F.2d at 555 n. 3. The government's brief further advised the Court:

> The setting of lease terms is an essential administrative action prior to the issuance of a [preference right] lease. . . . An EIS which discusses those lease terms is therefore required.

Brief for the Federal Appellees, supra, at 32-33.

---

you know, Interior's 1979 regulations governing PRLAs contained an extensive list of required contents for EISs and EAs. 43 C.F.R. § 3430.3-2 (1979). The new 1982 regulations delete these requirements entirely. 47 Fed. Reg. 33143 (1982) (to be codified at 43 C.F.R. § 3420.3-2). Objections to this deletion were answered last year with the promise that "specific instructions" would be forthcoming in "internal memoranda and manuals." 47 Fed. Reg. at 33126.

None has been issued. BLM's latest "commitment" to publish instructions, "during the summer of this year [1983]," comes too late. Letter from Director Robert F. Burford to Johanna H. Wald and Laura B. King, Natural Resources Defense Council, Inc., at 4 (April 5, 1983). The local BLM offices have completed, on their own and inconsistently, EAs and EISs without any uniform "instructions." Now, we suspect, no uniform instructions will be published, for fear of upsetting Interior's self-imposed goal of completing all PRLA reviews and lease issuances by December 1, 1984.

It is also evident as a practical matter that issuance of preference right leases (for mining projects typically covering from 5,000 to 25,000 acres, in many cases to be strip mined) will cause major impacts on wilderness, soils, water supply and quality, air, wildlife, cultural resources, and the local economy. Even as superficial as they are, these EAs amply demonstrate that the impacts will be significant.

As stated in our February 8 letter, the EAs are deficient because of omitted or inadequate analysis of:

1. Environmental impacts,

2. Measures to mitigate those impacts,

3. Lease terms to translate those mitigation measures into action,

4. Costs of compliance with mitigation measures,

5. Alternatives to lease issuance, and

6. Opportunity for public comment.

These serious deficiencies - documented in detail below - prevent the BLM from properly making the "commercial quantities" determination specifically required by the Mineral Leasing Act, 30 U.S.C. § 201(b) (1976).

The BLM's April 5 response to our February 8 letter does not respond to or rebut these deficiencies. It suggests that

> - a halt until program deficiencies are remedied is not "warranted," because of the Department's self-imposed completion date of December 1, 1984;
>
> - "whether or not EAs or EISs or both are prepared for all PRLAs," BLM has "fully compl[ied] with NEPA";
>
> - alternatives to lease issuance such as exchanges, cancellations, and withdrawals are "speculation" or "fruitless";
>
> - incomplete analysis of mitigating measures, costs, lease terms, etc., is a function of the "sequence of procedures" BLM has adopted for processing PRLAs.

That these points are not responsive to Judge Green's Order can be seen from the following (non-exhaustive) examples of the six deficiencies listed above:

1. Analysis of Environmental Impacts

The District Court opinion states:

> The EIS should not . . . be so limited that . . . it does not assess the overall environmental impact of the issuance of the leases. . . .

458 F. Supp. at 938. None of the PRLA environmental documents adequately does this. Discussion of three impact areas - reclamation, water resources, and wilderness values - gives a sufficient indication of these analytic deficiencies.

a. Reclamation. In areas to be strip mined, reclamation potential is obviously a critical concern. The analysis of reclaimability is needed not only to assess environmental consequences but to assist BLM in developing lease terms that will prevent unreclaimable areas from being developed and ensure reclamation of areas where it is feasible. Judge Green's opinion expressly states:

> NEPA requires the Secretary to determine particularized lease terms for land reclamation.

438 F. Supp. at 936. Not one of the environmental documents we have reviewed complies with this clear judicial directive. Many of them do not assess reclamation potential at all. See, e.g., the following Wyoming EAs: Stevens North, WY-062-2-27; Stevens South, WY-062-2-26; Sand Draw, WY-062-2-25; South Powder River, WY-062-2-28; Thunderbird, WY-061-1-48; Thunderbird II, WY-061-1-49; Wildcat Creek, WY-061-1-52; South Gillette, WY-061-1-47; Belle Fourche, WY-061-1-51; Ulm, WY-061-1-50. In every other case, the documents simply assume that reclamation will occur. the following quote illustrates the typical level of analysis:

> The soils, while rated poor, can be reclaimed but would require more intensive and costly management to be revegetated and stabilized.

Woodson EA, MT-020-48-2-46, at 28. Only one of the EAs even acknowledges the well-documented difficulties of reclamation in the West, let alone the extensive literature on the subject. See Beans Spring/Table/Black Butte Creek EA, WY-049-EA82-37, at 43.

b. Water resources. Most of the environmental documents are equally uninformative as to the impacts of mining on ground and surface water. For a blatant example:

> Mining impacts caused by each project would be similar to what other mines have created in Wyoming. The possible exception is their location in an aquifer recharge system (i e., the Rock Springs Uplift). Although insufficient data exist to accurately determine the scope of impacts, groundwater outside the mine boundaries could be affected.

Beans Spring at 42. Others are similarly cursory in treatment of this vital resource.

c. Impacts on wilderness values. Approximately 54,000 acres under 15 PRLAs lie in Wilderness Study Areas (WSAs) or areas currently under Departmental appeal for failure to be designated as such. Several of the EAs in these cases state or imply that there will be no diminution of the areas' wilderness values because their development will be conditioned by stipulation:

> There would be no impact to wilderness because any SUNOCO coal lease issued for lands under wilderness review must carry a wilderness protection stipulation (Appendix A, Interim Management Policy and Guidelines for Lands Under Wilderness Review) that would prevent any impairment of the land's suitability for preservation as wilderness.

Sunoco/North Kaiparowits, UT-040-82-23, at 22. This conclusory approach fails to examine the effect of the stipulation on the "commercial quantities" decision and fails to assess the impacts which may result from the "temporary" activities allowed under the stipulation.

Several of the EAs do not even acknowledge that the wilderness protection stipulation must be applied to PRLAs located in WSAs, thereby contradicting those EAs that do. Moreover, these inconsistent EAs dismiss the whole issue on the ground that "PRLAs possess rights which are not subject to the non-impairment standards." Meadowlark Farms/Henry Mountains EA, U-6733, U-6740, U-9238. This position is flatly contrary to Section 603(c) of the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. § 1782(c), the governing Solicitor's Opinion, 86 I.D. 89 (1978), and Rocky Mountain Oil and Gas Ass'n v. Watt, 696 F.2d 734 (10th Cir. 1982). Finally, the EAs on areas which have wilderness characteristics, but are not designated WSAs, contain no meaningful analysis of the impacts of coal development on those natural values.

2. Mitigation Measures

The District Court opinion contains extensive guidance on the need to develop in the EIS methods for mitigating environmental harms. 458 F. Supp. at 936-39. All of the EAs and EISs take this guidance lightly. Many do not discuss mitigation measures at all, even for identified environmental impacts. E.g., Meadlowlark Farms/Henry Mountains (socioeconomic); all of the Casper District, Wyo., EAs (water resources, socioeconomic). Where mitigation proposals are mentioned, in most instances they consist of no more than vague promises of "compliance with applicable laws" (e.g., Sand Butte; Meadowlark Farms/Elbert County, C-8257 to C-8261; Meadowlark Farms/Arapahoe County, C-8263, C-8264; Hand/Adams County, C-8265) or a proposal for a "study" (Meadowlark Farm/Henry Mountains; Sunoco/North Kaiparowits; all Casper District, Wyo., EAs; Sand Butte; Savery Final EIS).

None of the documents analyzes the effectiveness of the proposed mitigation measures nor alternative mechanisms to provide the needed mitigation. Thus, they provide absolutely no basis for agency decision on mitigation measures, lease terms, costs, or commercial quantities. This is a blatant violation of the Secretary's statutory obligation of "safeguarding . . . the public welfare" (MLA, 30 U.S.C. § 187) "to the fullest extent possible" (NEPA, 42 U.S.C. § 4332), as stated by the District Court. 458 F. Supp. at 936 n. 17; compare, Pring, Power to Spare: Conditioning Federal Resource Leases to Protect Social, Economic, and Environmental Values, 14 A.B.A. NAT. RES. LAW. 306 (1981). These inadequacies can be illustrated by four areas:

a. Socioeconomic impacts. The environmental documents indicate that, in many cases, development of the PRLAs will add significantly to already severe socioeconomic problems. "Socioeconomic and cultural costs of rapid industrialization and urbanization" were a particular concern of the District Court. 458 F. Supp. 936-37. Yet, none of the PRLA documents recommends what measures should be taken by the applicant to mitigate further socioeconomic impacts. One draft EIS conceded "significant impacts," but baldly stated BLM has "no authority" to control them. Savery Draft EIS at 15. In response to intense criticism, the final EIS switched to "little authority." Savery Final EIS at 19. Several other EAs indicate the need for such mitigation measures, but simply direct the applicant to conduct a "study," after the lease is issued, to determine what measures are needed. Savery Final EIS at 35; Beans Spring at 61.

This approach is a flagrant violation of *Berklund*.

b. *Cultural and paleontological resources*. The environmental documents indicate that many of the PRLAs contain significant cultural and/or paleontological resources. Unless protective measures are taken, historic and prehistoric relics and fossils will be destroyed by surface mining and threatened even by underground mining. Rather than specifying what mitigation measures must be taken to prevent the destruction of these resources, all of the EAs simply recommend that the applicant be required to conduct an "inventory" of the resources. For example:

> Before undertaking any activities that may disturb the surface of the leased lands, the lessee must have an archaeologist conduct an intensive field inventory for cultural resources on any areas that could be adversely affected by lease-related activities.

Stevens North at 14.

This approach plainly contravenes the *Berklund* decision. The BLM must know, before it makes any "commercial quantities" determination, the extent to which such resources exist and their location and must have developed specific proposals for their protection. None of the environmental documents performs this function.

c. *Reclamation*. As discussed above, none of the environmental documents adequately assesses the reclaimability of the PRLA areas. This lack has resulted in a failure by all the environmental documents to develop meaningful mitigation recommendations to ensure reclamation of the mined lands. At best, some documents specify the allowable steepness of spoil grading and recommend seed mixture guidelines *See*, *e.g.*, Beans Spring. In other cases, the EAs simply do not recommend mitigation measures at all. *See*, *e.g.*, Meadowlark Farms/Arapahoe County.

d. *Wilderness impacts*. In those projects where PRLA development on the periphery of Wilderness Study Areas will be detrimental to the wilderness values of those areas, the environmental assessments fail to propose mitigation measures to prevent such impairment. For example, a typical EA admits that

> The conveyor, powerline and service road would have significant on-the-ground impacts to both the Mt. Ellen/Blue Hills WSA's naturalness and the opportunities for solitude. As proposed, these facilities would follow the Sweetwater drainage and would cross approximately nine miles of the WSA. It would be difficult for a wilderness user to either visually or audibly ignore these evidences of man's presence.

Meadowlark Farms/Henry Mountains at unnumbered page ___, in Chapter 3, Section L.2. Then the EA does not even attempt to propose or analyze mitigation measures, stating:

> Any mitigation measures undertaken would be unlikely to reduce or alleviate impacts sufficiently to preserve and maintain wilderness values throughout the term of operations.

Id. It should be obvious that, without the required analysis of mitigation proposals, such a "decision" cannot be made. The BLM cannot issue preference right leases affecting WSAs until it has developed conditions that will "insure that the Secretary would preserve the wilderness character of the[se] lands." *Rocky Mountain Oil and Gas Ass'n v. Watt*, 696 F.2d 734, 747 (10th Cir. 1982).

3. *Lease Terms*

The District Court's decision in *Berklund* makes it unequivocally clear that

> NEPA requires the Secretary to determine *particularized lease terms* for land reclamation and air, water and wildlife protection. . . . NEPA . . . does direct him to exercise his authority to safeguard society and prevent irreparable damage to the environment through *careful and complete formulation of lease terms*.

458 F. Supp. at 936-37 (emphasis added). These may be

> either general performance lease standards which require mitigation, if not elimination of social, aesthetic and land resource costs to society . . . or more stringent lease requirements which will prescribe the detailed methods for mitigation of exceptional and special environmental harms.

458 F. Supp. at 937. Most of the environmental documents completely lack any such lease terms.

Moreover, the lease terms that are included in the EAs or accompanying decision documents do not approach the "particularized" level required by the Court. *Id.* Not surprisingly, the inadequacies of the mitigation measures, discussed above, are mirrored in lease terms. These include excessive reliance on existing law and regulations and upon applicant "studies" of the problem, after the leases issue. *See*, *e.g.*, all Casper District EAs; Woodson (Mont.) EA; San Juan River Regional EIS. In other cases, the mitigation measures recommended in the EA were simply not carried forward into lease stipulations. *See*, *e.g.*, Meadowlark Farms/Prairie-Custer Counties, MT-020-48-2-47 (surface water mitigation measures, at 26, not included in lease stipulations). The BLM is required by law to develop *detailed*, *site-specific* lease terms, based on mitigation measures that have been analyzed as to their effectiveness, prior to issuance of any preference right lease. The importance of this step cannot be overstated; as Judge Green observed:

> [B]ecause the cost of compliance with these lease terms will decide whether the permittee meets the commercial quantities requirement, it is the setting of the lease conditions which is crucial to the determination of whether or not the lease will issue.

458 F. Supp. at 936.

4. *Costs of Mitigation Measures*

The *Berklund* decision clearly requires the BLM to analyze and include the costs of recommended mitigation measures in the EIS:

> [T]he Secretary . . . should have before him a comprehensive EIS which includes a careful examination of possible performance lease standards, alternative methods for meeting those standards, *and estimated costs of compliance*.

458 F. Supp. at 938 (emphasis added). *None* of the environmental documents recommends mitigation measures in enough detail to allow the reader to estimate their costs, and not one presents the BLM's estimate of their costs.

This is a crucial omission, because, as Judge Green's opinion points out, the costs of mitigation "will decide whether the permittee meets the commercial quantities requirement" (458 F. Supp. at 936) and could mean a permittee "will be unable to make the requisite stautory showing and will not receive the lease." 458 F. Supp. at 937.

BLM's recent letter admits that it has adopted a "sequence of procedures" that turns the *Berklund* decision on its head, whereby

> Applicant's submission of information on costs of compliance, and BLM's evaluation of it, do not occur until after the environmental analyses are complete.

At 3. The agency's procedures clearly must be changed to comply with the Court's Order.

5. *Alternatives*

The District Court requires the BLM to consider two levels of alternatives in the EIS: (1) "alternative methods for meeting [performance lease] standards" and (2) "alternative courses of action" instead of lease issuance. 458 F. Supp. at 938. Both are lacking in the environmental documents reviewed.

The omission or inadequacy of lease term analysis, including alternatives, has been addressed above. The EAs are equally frivolous in addressing alternatives to lease issuance. A typical discussion admits that exchange or purchase is possible, but then comments:

> Either the exchange of sensitive areas or the purchase of Western Fuels' interests in a given PRLA area could result in the exclusion of mining in all or part of the Stevens North Unit.

Stevens North at 4. This conclusory statement, with no factual support, is no substitute for the detailed analysis of this issue spelled out in *Berklund*. 458 F. Supp. at 938.

6. *Public Notice*

In most cases, the BLM has made only a minimal effort to inform the public that the EAs have been prepared. Most of the documents were noticed only in local newspaper announcements, with no attempt made to actually notify local groups with a known interest in the subject or the plaintiffs in the *Berklund* case. Indeed, in one instance, when local people discovered that draft EAs had been prepared, their request to see those documents was denied until after the final EAs were issued. Letter from BLM Casper District Manager to Powder River Basin Resource Council (July 23, 1982).

The lack of public involvement in the preparation of the environmental assessments of the PRLAs has undoubtedly contributed to their failure to conform to the requirements of NEPA and the *Berklund* decision.

Conclusion

These organizations and others have a longstanding, demonstrated commitment to the National Environmental Policy Act and its application to the preference right coal leasing program. We would be happy to meet with your representatives, if that would produce constructive efforts to bring the program into compliance. Absent that, the seriousness of the current noncompliance and the reported imminence of lease issuance will leave us no choice but to initiate appropriate enforcement proceedings before the U.S. District Court.

Sincerely yours,

George W. Pring
Attorney at Law

GWP/cld

EXPRESS MAIL
RETURN RECEIPT

FILED

JUN 30 1978

JAMES F. DAVEY, Clerk

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

NATURAL RESOURCES DEFENSE COUNCIL, INC., et al :
Plaintiffs :
v. : Civil Action No. 75-0313
CURTIS J. BERKLUND, et al :
Defendants :
and :
UTAH POWER & LIGHT COMPANY, et al :
Intervening Defendants :

ORDER

Upon consideration of the cross-motions for summary judgment, the transcript of oral argument before the Honorable Judge Louis F. Oberdorfer, the entire record herein, and for the reasons set forth in the accompanying Opinion, it is by the Court this 30th day of June 1978,

ORDERED that defendants' and intervenors' motions for summary judgment are hereby granted insofar as the Court finds that the Secretary of the Interior does not have discretion to reject preference right coal leases under 30 U.S.C. § 201(b) where coal has been found in commercial quantities; and it is further

ORDERED that in all other respects, defendants' and intervenors' motions are hereby denied; and it is further

ORDERED that plaintiffs' motion for summary judgment is hereby granted insofar as the Court finds that where the issuance of a preference right coal lease would constitute a major federal action significantly affecting the environment, the Secretary is enjoined from issuing said lease unless he first prepares an appropriate Environmental Impact Statement (EIS); and it is further

ORDERED that in all other respects plaintiffs' motion is hereby denied; and it is further

ORDERED that this case is dismissed.

JUNE L. GREEN
U.S. District Judge

14-1 Thank you for your comment.

14-2 Thank you for your comment.

14-3 Thank you for your comment.

14-4 Thank you for your comment. Please refer to the scoping section in Chapter 1.

14-5 The analysis of elk habitat, potential impacts to elk, and development of a mitigation standards used data available through the Colorado Division of Wildlife. The section has been clarified to indicate this. The lease stipulations have been rewritten to more clearly indicate the requirement of 100 percent in kind habitat replacement for elk. The results in this study may be dramatically different from the unspecified studies in Wyoming because the habitat in the vicinity of the projects could be dramatically different. BLM is not relying on the mitigation plan to alleviate impacts, but rather the stipulations and requirements that would be attached to the lease (should one be issued).

14-6 Please refer to the lease stipulations in Appendix C. The mitigation standards proposed have been agreed to by both the BLM and CDOW.

You are correct in that the company had committed themselves to complete mitigation, and CDOW requires complete mitigation. The lease stipulation requires that a detailed mitigation plan be approved and securing of all necessary property rights by the company be completed prior to any mine development, to insure the requirement of 100 percent in-kind habitat replacement for elk.

14-7 The EIS makes Consol and the public aware that Consol will be responsible for data collection and mitigation of any significant sites at the mine plan stage. The EIS also states that potential for significant sites in the mine area exists. The costs for surveys and mitigtation surveys can be estimated for commercial quantities in the final showing.

14-8 As outlined in Chapter 1, costs are developed after completion of the EIS.

14-9 The lease stipulations have been rewritten to insure they are clear and enforceable, without changing the assumptions on which the EIS is based.

14-10 Because of the level of mitigation that would be required, no cumulative impacts to elk are anticipated, as the text has been clarified to indicate. The contribution of water resources to total dissolved solids in the Colorado River Basin has been identified. Cumulative impacts are only discussed where they occur (as is identified in the introduction to Chapter 3).

14-11 Please refer to the summary (first paragraph), and Chapter 1 where this discussion is contained.

14-12 Diligence requirements of other federal leases are not germane to, and have no bearing on, the environmental analysis.

The commercial quantities determination as outlined in 43 CFR 3430 is a separate step in PRLA processing, and is not part of the environmental analysis.

14-13 As discussed in Chapter 1 of the document an additional comment period was allowed.

15

HARRY KOURLIS RANCH
241 West Sixth
Craig, Colorado 81625

February 28, 1986

Bureau of Land Management
Greg Goodenow, Project Manager
455 Emerson Street
Craig, Colorado 81625

RE: James Greek Environmental Impact Statement

Dear Mr. Goodenow:

By commenting on the draft EIS, Harry Kourlis Ranch shall not be deemed to be consenting to any alternative, rather, the right to withhold consent is specifically preserved unless acceptable arrangements are made with Harry Kourlis Ranch.

The comments made by me are made in the interest of reducing the negative impacts of a mine development.

15-1 1. Environmental Consequences for Livestock. Evaluation was made in Chapter 3 on Pages 71 and 72, but no reference was made to livestock loss in the preferred alternative. They are significant and can reduce the usage of a renewable resource. A proposed action should be developed and made into the preferred alternative, to resolve such conflicts by relocation and landowner consent becuase of the amount of deeded property.

15-2 2. Mitigation for Wildlife. Enhancements of off-site areas should well exceed an acre for acre replacement. The additional wildlife usage on neighboring property, especially during spring and winter may over utilize certain preferred plants causing a reduction or elimination of those plants, reducing the carrying capacity of these properties.

15-3 3. To Reduce the Impact on Migration and to Encourage Grazing and Calving Distribution. Overpasses as well as underpasses should be installed in transportation corridors. I believe wildlife will utilize overpasses more readily because they would have natural appeal especially if it is covered with dirt and vegetation.

15-4 4. Public Access. Public access to lands leased by Consol for hunting and recreation would increase the disturbance to elk and deer. If public use was to increase substantially, elk and deek would have a tendancy of concentrating on less accessible areas, causing them to compete for the limited forage that was available in the substitute area. Wildlife would be in poorer condition going into winter, causing a decrease in conception rates and increase winter mortality. These activities could reduce calving/fawning percentages. Controlled access in certain seasons may help reduce this impact.

15-5 5. Post Mined Vegetation. The utilization of sagebrush to reach the proper shrubs ratio and percentage should be avoided. Sagebrush has the ability to "choke-out" other favorable plants.

15-6 6. Water Resources. Water impoundments and perennial seeps should be designed to provide water in drought years. James Creek itself should be protected for this purpose because it is a reliable water source, during these periods.

Not specifically addressing the James Creek EIS but a subject that may eventually have great impact is the cumulative effect multiple mines would have on wildlife, water, air, and mitigation may be incorporated to address impacts that affect larger areas.

Sincerely,

Thomas A. Kourlis
Harry Kourlis Ranch Partner

TAK/sj

15-1 Impacts are identified in Chapter 3 under "Livestock Grazing and Other Land Uses", and in the impact summaries. The major impacts of mine development to livestock grazing occur on private surface. While the coal company must compensate the private surface owner for the loss of his/her land, it is up to the private parties involved and not the BLM to determine what form of compensation should take place.

15-2 See 14-5. While these are valid concerns, based on the mitigation plan proposed by Consol in Appendix D and the stipulations contained in Appendix C, BLM does not anticipate these problems will arise. Monitoring of enhancement areas surrounding the PRLA (see Appendix C, Stipulation 2), would detect such changes and permit adjustments to mitigation efforts if warranted.

15-3 Site specific objectives such as wildlife overpasses or underpasses will be addressed during the mine permitting process. Your comment, by its inclusion in this EIS, will be forwarded to the permitting agencies.

15-4 Lands leases for public access will replace public lands that become unavailable and will be for hunting only; therefore, there should be no significant change from current conditions. Physical condition of wildlife going into winter should not change from present conditions. The text has been clarified.

15-5 We agree that in the long term sagebrush does have the ability to "choke out" other plants. OSMRE and the Colorado Mined Land Reclamation Division will establish the exact species mixture during the mine permitting process. Your comment, by its inclusion in this EIS will be forwarded to the permitting agencies. In addition, the stipulations have been clarified to discourage establishment of sagebrush.

15-6 Your concerns will be forwarded to the permitting agencies by their inclusion in this EIS. Also, please refer to the hydrology stipulations in Applendix C.

16

COLOWYO
COAL
COMPANY
PEOPLE, PRODUCTION & ENERGY

5731 State Highway 13
Meeker, Colorado 81641
(303) 824-4451

February 28, 1986

Mr. Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

We would like to express our appreciation to the BLM for the opportunity to comment on the Draft James Creek Environmental Impact Statement (EIS).

16-1 While we recognize that this PRLA is different than competitive federal coal leasing, one of our primary concerns with the EIS and the proposed lease is that in the future the BLM will attach many of these same stipulations to competitive leases. Most of the stipulations can not be justified, and if the BLM takes this same approach to competitive leasing, federal coal, which is already difficult to develop, will not be attractive to the coal industry. Also, if the BLM attempts to include these onerous wildlife stipulations as a part of the Habitat Recovery and Replacement Plan that is included in post 1980 federal leases in the Craig District, it will seriously decrease the opportunity for development of those leases.

16-2 We believe that the BLM's decision to include detailed design criteria at the leasing stage is seriously flawed because of the uncertainty of the time of development. All detailed stipulations, which at best should be performance standards, not design criteria, should be considered at the mine plan review stage to reflect the current environment, technology, economy, and legal constraints.

Attached please find our specific comments addressing many of the sections contained in the EIS.

We would also like very much to schedule a meeting with you and your staff to discuss any or all of our comments. We believe there have been many important issues raised in the EIS to which we have addressed our comments and would appreciate an opportunity for further discussion with you.

If you wish to discuss a future meeting or have any questions concerning our comments, please call me at your convenience.

Sincerely,

COLOWYO COAL COMPANY

Richard G. Atkinson
Chief Reclamation Engineer

RGA/yml
Attachment
cc: Central Files

WILDLIFE

GENERAL COMMENTS

16-3 Detailed environmental stipulations regarding wildlife mitigation should not be addressed at the lease issuance stage, rather, mitigation should be addressed at the mine permitting and mine plan stage. Since the time of mine development is uncertain, all detailed stipulations should be considered at the mine plan review stage to reflect the current environment, technology, economy and legal constraints.

16-4 The stipulations and mitigation proposed by the BLM and, at times, contained in Consol's own mitigation plan prepared by CDM, are not justified based on the results of the environmental studies conducted by Consol (CDM). In many cases, the elk studies show that the impact to elk is insignificant, while the proposed mitigation totally ignores the facts and appears to assume that the associated elk population will be destroyed.

16-5 The proposed stipulations and mitigation seem to treat this PRLA as a research project for wildlife rather than as a potential coal mine. The data obtained from the elk studies conducted by CDM certainly do not justify the magnitude of the minimum levels of monitoring commitments or long-term funding of $300,000 per year for the life of the mine. To spend over $9 million for elk studies during the 30 year life of the mine is not justified by the CDM research, and an unreasonable sum of money which will ultimately be passed on to the coal customers.

SPECIFIC COMMENTS

16-6 Calving Habitat (page 62)

Baseline studies by CDM suggest that removal of the calving habitat within the study area could cause a displacement of up to 3% of the elk herd in GMU's 12, 23 and 24, or effect up to 300 animals. Although the "effect" is not quantified, it would be reasonable to assume that the animals are displaced to other areas. Unless data is available to indicate that adjacent areas are currently at carrying capacity for calving habitat, we believe the "effect" to the displaced animals will be immeasurable to minimal.

16-7 Based on the DOW 1985 DAU Management Objectives for DAU E-6, the White River elk herd should increase from a 1984 post-hunt estimate of 14,610 animals to a 1988 post-hunt objective of 18,000 animals. In addition, the projected 1985 Harvest Objectives for GMU's 12, 23 and 24 indicate that over 1000 animals were to be harvested. Given the DOW objectives for the White River elk herd of continued growth (23% overall) and continued hunting season harvests, the availability of all types of elk habitat, including calving grounds, appear to be in abundance.

16-8 Winter Range (page 62)

A critical factor to the overall survival of the elk herd is the availability of winter range during a critical winter. The winter of 1983-1984 was such a winter. The CDM study suggests that during that winter, the elk wintered in areas below 7000 feet in Axial Basin and the White River valley. BLM suggests that maintaining higher elevation winter ranges is important during open winters, but has not indicated whether there is a shortage of these particular areas, and whether these areas are at carrying capacity.

16-9 Again, given the DOW projections of a 23% growth in the White River elk herd in the next three years, we suggest that overall the availability of transitional range in adjacent areas is not critical, and the areas are certainly not at carrying capacity.

16-10 Migratory Route (page 62)

The CDM data clearly suggests that elk migration in the vicinity of the PRLA is not through distinct corridors, but rather elevational drift influenced heavily by pressure during hunting season.

16-11 The BLM position that the elk migration corridor through the Ninemile area should be preserved, apparently contradicts the data.

Apparently because of the BLM's position, Consol has made major changes to the initial surface proposal submitted to the BLM as shown on Map 2-1 Consol's Initial Surface Proposal. The revised plan is addressed on Map 2-3 Area Disturbance by Year and Proposed Facility Areas. The revised plan is based on the CDM elk study and discussions with BLM and DOW. Of particular importance is the relocation of the surface support facilities and establishment of the avoidance area.

16-12 The data obtained from the CDM elk study clearly does not justify such a change in the original surface proposal submitted by Consol.

16-13 In addition, the BLM has not addressed the economic impact of the loss of 100 million tons of coal reserves due to establishment of the avoidance area. The inability to mine these reserves will result in the loss of millions of dollars of royalties, a shortened mine life and loss of coal resources. These economic losses should be analyzed in light of the facts as presented in the CDM elk study.

16-14 Appendix C, Coal Lease, Section 15, Special Stipulations (Page 119)

In general, virtually all of the special stipulations in "1. Wildlife" should be reevaluated in terms of the data obtained in the CDM Elk Study. The special stipulations frequently require design criteria which should not be addressed until permitting and the mine planning stage. Many of the stipulations require long-term elk studies, reclamation design criteria, enhancement areas, etc., to mitigate for impacts to the elk populations that are not documented by the CDM Elk Study.

16-15 There appears to be a contradiction where Consol is required, on the one hand, to provide extensive, unjustified mitigation to preserve and enhance elk populations, while on the other hand, public access, including hunting, is to be allowed in virtually all areas in order to fulfill the harvest objectives of the DOW. This appears to be in conflict with the information contained in Section 2.1.2 Responses of Elk to Mining Disturbance of the "CDM PRLA Elk Mitigation Study, Mitigation Assessment and Plan". This section indicates that the effects of noise and human harrassment on elk is much more adverse to elk population than is the day to day activities of mining activities.

16-16 The bottom line appears to be that ultimately the DOW will benefit from these unreasonable stipulations by requiring unjustified elk mitigation, elk research programs, increased hunter access and, most importantly, more revenues from hunting in the areas.

RECLAMATION - VEGETATION & SOILS

16-17 GENERAL COMMENTS

Detailed environmental stipulations regarding vegetation and soils should not be addressed at the lease issuance stage, rather, mitigation should be addressed at the mine permitting and mine planning stage. Since the time of mine development is uncertain, all detailed stipulations should be considered at the mine plan review stage to reflect the current environment, technology, economy and legal constraints.

16-18 SPECIFIC COMMENTS (page 22 and page 36)

Many of the vegetation and soils stipulations and requirements of the BLM and commitments made by Consol, are made in order to mitigate alledged wildlife impacts that are not justified based on data obtained by the CDM Elk Study.

16-19 Furthermore, specific requirements such as additional soils testing, additional soils depth, vegetation bond release criteria, post-mining topography requirements, and establishment of perched water tables should not be a part of the lease, especially if the technologies are not yet proven or may be proven to be outdated and unnecessary technologies at the permitting and mine planning stage.

16-20 The document states that no healthy aspen stands have been produced on reclaimed areas and requires an additional 6 inches of topsoil be replaced to increase success. While aspen regeneration success has been difficult, it is being done, and the most important concern is water management, not water holding capacity, and thus increased soil depth.

16-21 Appendix C, Coal Lease, Section 15, Special Stipulations
Section 2. Soils and Vegetation

This section contains many design criteria for reclamation of soils and vegetation which should not be addressed until permitting and mine planning. Specifically requiring a program of soils testing of questionable worth, requiring unproven vegetation success standards, sediment pond siltation standards, etc., should not be part of leasing, and may be contrary to current mining regulations.

HYDROLOGY

16-22 GENERAL COMMENTS

There appears to be a major flaw in the groundwater section (pages 47-54) since the BLM has assumed that spoil hydrology will equate with dragline spoils, when in fact it will be very different because it will be constructed in layers by trucks. The trucks tend to compact the road surfaces to such an extent that there would be multiple compacted mine spoil zones from the pit floor to the reclaimed surface.

SPECIFIC COMMENTS

16-23 Page 22

The BLM proposes to mitigate the impact to water quality and quantity with, among other things, sediment ponds designed for a 40 year-24 hour storm, and creating artifical seep areas. We wonder why the ponds should be designed different than the ponds required by SMCRA (10 year-24 hour storm events). We also question the wisdom of stipulating unproven technologies, such as artificial seeps, when such technology may never become possible, or may in fact produce undesirable seeps with high TDS.

16-24 Design criteria should be considered at the mine planning and permitting stages rather than the leasing stage.

16-25 Page 26

The BLM states that some existing uses of surface water may be precluded. What existing uses of the water will be protected under the BLM's preferred alternative? The current agricultural practices that are conducted downstream of the PRLA would not be impacted by the changes predicted in the EIS.

16-26 Page 54

The EIS states that "OSM and CMLRD regulations require compensation be given to the owner of a water right if a water supply has been contaminated, diminished, or interrupted from a coal mine operation (30 CFR 715.17(i), 30 CFR 816.41(h) 1984; CMLRD Regulations 1.12, 4.05.15 1980)". This statement may be misleading, in that the OSM regulations require replacement, not compensation, and the MLRD regulations (which would control the operation) require replacement in a manner consistent with applicable state law for a vested water right that is proximately injured. BLM appears to have interpreted these regulations in a manner that may not be consistent with the regulations.

16-27 Page 60

The EIS states that piping and associated sink holes approximately 10 inches to 4 feet in diameter and 1 to 3 feet in depth in the valley bottom of James Creek make a very unstable surface for road construction and heavy truck traffic. The BLM should note that these concerns would be negligible to any major construction such as would occur in development of the PRLA.

16-28 Page 95

The BLM states that flood control measures should be designed to ensure protection of Highway 13/789 and the ranch property located three-fourths of a mile downstream from the James Creek and Good Spring Creek confluence.

It is unclear whether Consol will be required to protect the cited structures from preexisting flood hazards, or floods from mining related activities. If a 100 year flood were to occur in the region, it is expected that there would be major flood related damage, erosion, highway damage, etc., regardless of whether Consol's operation was in the area or not. Requiring protection of unrelated structures in the area from a 100 year flood should probably be added to the "Infeasible Mitigation" section.

MISCELLANEOUS COMMENTS

16-29 Page 14

The BLM states that "under current conditions, enough coal is available in existing permitted mines for production of up to 29 million tons annually." However, it would be appropriate to include an analysis of the reserves for the permitted operations to determine the sustained production capacity.

16-30 Page 20

The BLM makes reference to a "Colorado and Wyoming Railroad Company". The existing rail line serving Colowyo is a private line from the Empire Energy spur to the Colowyo loadout owned wholly or by Colowyo (2/3) and a potential (1/3) owned by Northern Coal Company. The Denver and Rio Grande Railroad Company is contracted by the coal customers to transport the coal on the private rail line.

16-31 Page 27

The BLM prefers a restriction that a conveyor system or slurry pipeline be built adjacent to the James Creek buffer zone rather than a haul road unless Consol can demonstrate that such a restriction is unnecessary. Apparently the BLM does not recognize that if an alternate coal haulage system is built, an associated access road will still be required during construction and for access and maintenance. Therefore, such a restriction on roads seems to be unnecessary.

16-32 Page 77

Under BLM's preferred alternative, areas would be made available to displaced hunters. Why should the issuance of this coal lease give the BLM the right to preclude Consol's surface ownership rights in other areas? To mitigate for displaced elk is one thing, to require mitigation for displaced hunters seems to be beyond the scope of the impact statement, especially if the BLM intends to infringe on the property rights of surface owners in unrelated areas.

16-33 Page 78

The Economic Assumptions include basic agricultural labor, which appears to conflict with Table 3-15, which indicates less than 7% agricultural employment in Moffat and Rio Blanco Counties.

Page 93

The BLM states "Feasible mitigation includes those stipulations that are appropriate at the leasing level, rather than at the mine permitting stage, and are workable and enforceable with current levels of data and information".

16-34 We believe that most of the design criteria in the stipulations should be addressed at the permitting stage, rather than the leasing stage. For example, we do not believe that the vegetation success criteria for ASPEN and creation of "artificial" springs by burying impermeable membranes or other types of aquifuges qualify as "workable and enforceable with current levels of data and information".

16-35 Further, the EIS states that the BLM must eventually bear the cost of the maintenance and repair of water impoundments. The EIS should clarify that the BLM manages only 11% of the surface involved, and maintains impoundments on public lands throughout the region, which would result in a negligible impact in this regard.

16-36 The BLM's preferred alternative that requires Consol to allow public access, and thus public hunting on public lands within 1/2 mile of buildings and work areas, would be totally unmanageable and shows a complete lack of understanding of mining activities and concern for the safety of individuals working at the site.

My name is Richard Atkinson. I'm with Colowyo Coal Company, and my comments that I have tonight are general in nature. We will be providing written detailed comments to you by the deadline.

In addition to that, after we've submitted the comments, we would like to meet with you and go over them, if that works into your schedule.

MR. GOODENOW: That will be fine.

MR. ATKINSON: We do appreciate the opportunity to comment on this EIS, and I think our comments -- everything I have to say, in general, is negative in nature in regard to the EIS.

We don't comment specifically in the report to the PRLA, nor do we have comments negatively in that regard, only specifically in the EIS.

16-37 Our problem is that the BLM has issued many statements in the issuance stage that we feel would be more appropriately issued at the mining stage. Since the mining time is uncertain at this time, we feel that stipulations should be considered at the mine review stage to reflect the current environment at that point in time, the technology at that time, the economy at that time, and the legal constraints at that time, that they would be more appropriate.

16-38 In addition, we feel that the environmental studies conducted by Consol, particularly in relation to elk, do not justify the stipulations and degree of mitigation proposed to be a part of this lease. The elk studies that were done by Consol indicate insignificant impact to elk, and yet the stipulations as written in a manner the proposed mitigation presumes that the elk will be destroyed. We feel that's a fallacy.

16-39 In many instances, the BLM was unable to quantify their impact, so the document is full of "might impact" or "might result", and from those statements BLM proceeded to include extremely onerous stipulations that would seem only appropriate if impacts were known to be very significant in the mine impact.

16-40 It appears to an outside observer that the BLM doesn't regard this PRLA to be a coal mine, but as an opportunity for research studies. It's our opinion that even if Consol agreed to every stipulation that BLM could come up with, that that doesn't represent responsible land management. It would seem that if the BLM doesn't intend to issue the lease, they should say that in the first place and save us all of this expense.

16-41 Another concern we have is that the document seems to be poorly lacking in an economic analysis, particularly in regard to lost royalty for the coal that will not be mined as a result of the proposed environmental stipulations. 16-41 cont.

13-42 And then finally, one last comment. Specifically, it appears to us that there's a major flaw in the groundwater section since the BLM has assumed that spoil hydrology will equate to dragline spoils, when, in fact, it will be constructed in layers by trucks.

That's all the comments I have now. And we will submit detailed comments prior to the deadline. Thank you.

16-1 Thank you for your comment.

16-2 It is BLM's preference to avoid operational stipulations in the lease unless necessary for resource protection beyond that usually or customarily required. Two special conditions occur in this instance:

1) Portions of the surface lie within the Colorado Division of Wildlife's Jensen State Wildlife area.
2) Because of PRLA processing requirements, any special mitigation techniques need to be identified in enough detail for costs of these techniques to be analyzed in the final showing.

Because of the concern over the stipulations proposed in the Draft EIS, and because of apparent misunderstandings of the intent of those stipulations, the stipulations have been rewritten. Please refer to Appendix C.

16-3 See 16-2.

16-4 The proposed mitigation assumes the elk will be displaced not destroyed. Impacts discussed are those which remain after mitigation. Thank you for your comment.

16-5 Thank you for your comment.

16-6 The total elk disruption or displacement, both on and off-site, is estimated to be up to 300 animals. Based on available information, the impact is considered insignificant after mitigation. Impacts discussed in the document are those which remain after mitigation. The quality of available habitat, not the quantity is a primary concern. The quality of the habitat is the focus of the mitigation. While sufficient quantity of surrounding calving appears to be available to absorb animals displaced from the PRLA, the mitigation plan and stipulations were designed to ensure that the areas could accomodate additional elk during the calving season. Monitoring to be implemented as part of the mitigation plan will provide information needed to determine the extent of calving area enhancement.

16-7 Thank you for your comment.

16-8 The haystacks located in Axial Basin and the White River Valley created a diversion that was more attractive than natural winter ranges. BLM considers this use undesirable and it does not constitute a replacement of natural winter range.

16-9 Transitional range in adjacent areas may not be critical at present. Mitigation proposed is not based on the amount of lost transitional range but is based on the amount of lost production. The mitigation proposed is based on 100 percent in kind habitat value replacement.

16-10 and 16-11
The James Creek area is one of several areas used to "drift" through the transitional ranges. Thank you for your comment.

16-12 Your opinion has been noted. Thank you for your comment.

16-13 Clarification made in text.

16-14 The CDM Elk Study was one set of information that was evaluated. BLM and CDOW records are also considered when developing the stipulations. PRLA processing requirements (43 CFR 3400) were also considered. Thank you for your comment. See the response to 16-2.

16-15 See 15-4.

16-16 Thank you for your comment.

16-17 Thank you for your comment.

16-18 We included BLM, CDOW, and CDM data in our analysis. Thank you for your comment.

16-19 In order to characterize the existing fertility and productivity adequately, these additional tests are needed. In the long run this will allow the lessee to duplicate natural or pre-disturbance conditions during the reclamation process.

Soil depths have been correlated with increases in site index of aspen (Fralish, 1967). This relationship exists until depths of greater than 60 inches are achieved. Other literature (DeByle, 1985) indicates the enriched zones of organic matter in aspen associated soils range from a depth of 24 inches to 35 inches. Therefore, requiring a topsoil depth of 30 inches or 2.5 feet is appropriate.

16-20 BLM is not aware of documented long-term aspen reclamation success in similar habitat types and no information has bee provided to BLM that would support or document this process.

Literature states that under natural conditions water is present in the lower portions of the soil profile.

While we agree that water management is important, the idea that water holding capacity is not important represents a difference in professional opinion. Soil does have to have the ability to hold soil moisture in the quantities necessary for the various plants. Therefore, it may be necessary to reclaim an area with materials, such as the pre-disturbance aspen soils, which have the proven ability to hold the needed water. Literature (Fralish, 1972) indicates, a relationship between site index and available water holding capacity is very strong (r = 0.658) and indicates that growth is controlled by available soil water.

16-21 Thank you for your comment.

16-22 There is a great deal of uncertainty regarding groundwater impacts. It is for this reason that a broad range of possible impacts is presented.

16-23 Since the mine life is anticipated to be 30 years, sediment ponds have been designed to a standard of more than ten years.

These "unproven technologies" are proposed as studies and will become stipulations if the studies prove successful. Other design criteria, terrace spacing, transportation of coal, etc. are left to the permitting stages.

16-24 Thank you for your comment.

16-25 The text has been corrected.

16-26 Thank you for your comment. The wording reflects broad requirements and is not intended to mean only financial compensation.

16-27 Thank you for your comment. The statement has been deleted.

16-28 The text has been clarified.

16-29 The discussion has been modified to address your concern. Sustained production capacity would depend on both permitted reserves, and leased reserves not presently permitted.

16-30 Thank you for the correction.

16-31 The stipulations have been revised.

16-32 The loss of public access will be mitigated by opening other areas to public use. BLM will not infringe on the property rights of surface owners in unrelated areas. Arrangements will be between the lessee and private surface owners.

16-33 Impacts were assessed against then current trends and conditions, which indicate all agriculture employment was at 6.8% in Moffat County and 6.4% in Rio Blanco County. The source of this data is Colorado Division of Local Government, the Bureau of Economic analysis, and BLM estimates.

16-34 Thank you for your comment.

16-35 The text has been corrected.

16-36 The final mine plan will determine the buffer zone. See the stipulation, "unless such access would interfere with mining operations or create a safety hazard".

16-37 Thank you for your comment. In Chapter 1, a discussion of the EIS is presented explaining the level of anlaysis required for PRLA processing.

16-38 and 16-39
The impact analysis is appropriate. The analysis reflects impacts that would remain after mitigation.

16-40 Thank you for your comment.

16-41 Stipulations proposed by the BLM above and beyond the applicants proposal would not preclude development of coal on the PRLA. In order to maintain flexibility in possible mine development, stipulations in BLM's Preferred Alternative have been revised in the Final EIS (please refer to Appendix C) in order to allow efficient recovery of coal resources. BLM's Preferred Alternative in the Final EIS does not preclude development. No royalties would be lost

16-42 Please refer to the response in 16-22.

17

STATE OF COLORADO RICHARD D. LAMM Governor

DEPARTMENT OF NATURAL RESOURCES

DAVID H. GETCHES, Executive Director
1313 Sherman St., Room 718, Denver, Colorado 80203 866-3311

Geological Survey
Board of Land Commissioners
Mined Land Reclamation
Division of Mines
Oil and Gas Conservation Commission
Division of Parks & Outdoor Recreation
Soil Conservation Board
Water Conservation Board
Division of Water Resources
Division of Wildlife

February 28, 1986

Mr. Greg Goodenow
Bureau of Land Management
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

State agencies have completed their review of the James Creek Coal PRLA Draft Environmental Impact Statement. This letter consolidates the input from the commenting agencies.

17-1 The Division of Wildlife, BLM and Consolidation Coal Company have worked closely to identify and analyze project impacts to wildlife, particularly elk. A comprehensive mitigation package has also been developed. Individual mitigation measures will be included as lease stipulations or otherwise incorporated in the mining and reclamation plan. Cooperation on important wildlife issues has been exemplary and the constructive outcome reflects this effort. Discussion of specific topics between BLM and the Division are continuing.

17-2 Some of the special stipulations presented in Appendix C of the DEIS seem to deal with impacts and mitigations which are covered under the permit process defined by the Surface Mining Control and Reclamation Act and the Colorado Surface Coal Mining and Reclamation Act. In particular, some of the stipulations may be premature with respect to development of the mining and reclamation plan, some seem to duplicate requirements of the surface mining laws and some may conflict with specific rules and regulations promulgated under the laws.

The Mined Land Reclamation Division and Division of Wildlife will meet to discuss the special stipulations and outline an approach for complying with the statutes while preserving the mitigation commitments. Following this meeting, I suggest that BLM, OSM and the two Divisions meet to review the stipulations. Steve Morris of my office will arrange these meetings at the earliest opportunity. I do not anticipate that this dialogue will delay preparation and release of the final environmental impact statement.

17-3 The DEIS identifies water rights in the vicinity of the project and correctly states that compensation might be required for the owners of local water rights that may be impacted by the development. In addition, Consol must obtain a legal right to any water used in the mining operation.

17-4 On page 41, the document states, "the Colorado Division of Water Resources has established stream classifications and water quality standards for certain waters." It is the Colorado Department of Health that sets classifications and standards, not the Division of Water Resources.

The Colorado Department of Highways has forwarded its comments to you in a letter dated January 22, 1985. Please consider it as part of the state's consolidated response. A copy of the letter is attached.

Thank you for the opportunity to review this document. Please feel free to contact me or Steve Morris if you wish to discuss any of these comments further.

Sincerely,

DAVID H. GETCHES
Executive Director

DHG:nsh:9348
Attachment

cc: Commenting State Agencies

A-95 Review BLG

STATE OF COLORADO

DEPARTMENT OF HIGHWAYS
222 South Sixth Street, P.O. Box 2107
Grand Junction, Colorado 81502-2107
(303) 248-7208

January 22, 1986

DUPLICATE-See Letter 7

JAN 1986
TRANSPORTATION PLANNING DIVISION

Mr. Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson Street
Craig, CO 81525

Dear Mr. Goodenow:

The Colorado Department of Highways' District III office has reviewed the Draft Jones Creek Environmental Impact Statement (EIS) and has the following comments.

The development of a large production coal mine which produces ten million tons of coal per year would have a significant and adverse impact on S.H. 13, if coal were hauled on S.H. 13 to either Craig or Rifle. Therefore, we request that permits for development of the James Creek coal mine specifically prohibit the permanent or temporary trucking of coal on S.H. 13 without providing appropriate mitigation measures to maintain a safe highway facility. These measures would include the construction of climbing lanes on grades steeper than 2.5 percent and the channelization of major mine access intersections that tie directly into S.H. 13. In addition, if substantial roadway surface or subsurface damage occurs after the first year of repetitive coal haul, the mine operator would be required to participate in the restabilization and repaving of damaged sections of S.H. 13.

All existing and new mine access points onto S.H. 13 will require the submittal of Colorado Division of Highways' access permit applications due to the significant increases in production levels and traffic volumes at the mine site. The access permit submittal and review will be required regardless of the method of coal transport utilized.

It should be noted that the requested mitigation will not be required if coal is shipped to available markets with the use of unit trains on the "anticipated" rail extensions as proposed in this Draft EIS.

We appreciate the opportunity to review and comment on the Draft EIS at this time. We also request a copy of the Final EIS for this project when it is available for public review.

Very truly yours,

R. P. MOSTON
DISTRICT ENGINEER

Laurence R. Abbott
By LAURENCE R. ABBOTT
DISTRICT ENVIRONMENTAL MANAGER

LRA/jme
cc: Siebels
Chocol
Moston/Perske
File

17-1 Thank you.

17-2 We have closely cooperated with the Office of Surface Mining Reclamation and Enforcement, and through them the Mined Land Reclamation Division, to avoid conflicts.

17-3 Thank you for the information.

17-4 Thank you. We have made the correction.

18

Colorado Chapter of The Wildlife Society

27 February 1986

U.S. Bureau of Land Management
PO Box 248
Craig, CO 81626

Attention: Mr. Greg Goodnow

Dear Mr. Goodnow:

I have recently reviewed the James Creek Coal Preference Right Lease Application DEIS, on behalf of the Colorado Chapter of the Wildlife Society. The discussion of various game species and species groups is well done as is the section on raptors. However, the vegetation section is very weak and raises one major concern.

18-1 Table 3-10 which describes vegetation types, indicates wetland willow stands have an overstory, understory and herbaceous layer. To me this indicates a good stand of willow trees with some shrubs in the understory and grass and forbs in the herbaceous layer. If this is actually the case, these willow stands can be considered riparian habitat, which is arguably the most important wildlife habitat in the State of Colorado (Schmidt, R.A. (Ed.) 1983. Management of Cottonwood-willow Riparian Associations in Colorado. Colorado Chapter of the Wildlife Society. Fort Collins). If this is not the case Table 3-10 should be revised to more accurately describe the vegetation types present.

However, if it is riparian habitat the loss of this habitat should be addressed and appropriate mitigation presented.

18-2 One other comment is that the section discussing beaver (pg. 70) includes a reference to Madison (1984). I could not find this reference in the Literature Cited Section.

I hope that the above comments are constructive. If you have any questions about any of these points, please feel free to call me at 303-431-4749 or write to me at 6134 Otis. St., Arvada, CO 80003.

Sincerely,
COLORADO CHAPTER OF
THE WILDLIFE SOCIETY

Peter H. Davis
President

18-1 The table has been changed to clearly reflect that these are riparian habitats. Mitigation of impacts to this habitat is considered to be very important.

18-2 Thank you for the correction. The change has been made.

19

601 Canyon
Boulder, Colorado 80302
303•449•5595

SIERRA CLUB SOUTHWEST OFFICE

2-28-86

COMMENTS ON JAMES CREEK COAL PRLA - EIS

19-1 In the final permitting process, BLM must ask whether there is a need for more coal production in Colorado, and if the gains from more production outweigh the adverse impacts of development. Specifically BLM must consider whether revenues from the sale of coal will exceed the costs of extraction, reclamation and mitigation. Mitigation costs are crucial to consider when the feasibility of the project is marginal at the onset.

The EIS states that coal already under lease in Colorado far exceeds the permitted production levels and projected production levels of 16-20 million tons per year by the year 2000. It also states that permitted production far exceeds actual demand and actual production. Therefore, with a current and future glut of coal development, is it necessary that Consolidation Coal Company (Consol) expand on this extensive production, with a proposed mining project turning out 10 million more tons of coal per year? It is clear that that question must be answered in the negative (the no action alternative) when the absence of need is weighed against the environmental impacts of the proposal.

The impacts of the development are outlined as follows:

19-2 1. Air quality - air quality would be adversely impacted by the project. The existing value of Total Suspended Particulates (TSP) is 26 micrograms per cubic meter. The proposed development would contribute an additional 35 micrograms per cubic meter, bringing the TSP value to 61. This exceeds secondary air quality standards of 60 micrograms per cubic meter.

19-2a 2. Soil - the development would cause an increase in erosion, loss of stability, and loss of productivity in the soils of the area. This is especially important when considering the loss of vegetation. If soil properties are destroyed, revegetation could be difficult to impossible for certain species, especially the aspen stands in the area (see vegetation and wildlife sections).

19-3 3. Vegetation - the premining vegetation of trees and shrubs would be replaced by postmining populations of grasses, resulting in a loss of such wildlife habitat; the aspen stands are particularly important to the elk and deer of the area (see wildlife section). Loss of vegetation would also result in increased solar radiation to the surface, which would alter periods of snowmelt and peak flows, and decrease evaporation and interception of water from the surface. There would also be a loss of wetlands and riparian zones because of loss of water quality and quantity (see water section).

19-4 4. Water - the James Creek watershed would be altered significantly by changes in base flows, runoff, and peak flows, brought on by decreased vegetation. More importantly, however, are the projected increases of 5-10 times in Total Dissolved Solids (TDS) in the groundwater, estimated to reach 2000 to 3900 mg per liter. This level of pollution results from the grinding up of saline mine spoil in the mining process and back-filling the pit with this material. This high level exceeds the recommended maximum (3000 mg per liter) for livestock and wildlife use, and levels above 1000 - 2000 mg per liter may have adverse effects on nearby crops. Development may also bring about a flood threat to nearby highways and ranch property, and local water-rights owners may find their rights being bought out by Consol.

19-5 5. Wildlife and livestock - complete loss of habitat would occur for raptors, fish, and possibly beaver in the mine area. Loss of winter range and migratory routes of elk would occur, and habitat loss for deer could be drastic. The aspen stands on the site would be removed, leaving the deer completely without their vital summer range. A decrease in water quantity and quality would cause loss of riparian zone vegetation used by livestock, and half the forage allotment in the area would be unavailable for a 7 year period of mining operations (23rd through 30th year of operations)

19-5a 6. Economy - the most surprising conclusion of the EIS is the blatant statement of the fact that employment in the area will not increase with the project but may in fact decrease. Consol makes the assumption that one operation with state-of-the-art equipment employing 850 persons would be more efficient than many operations with older equipment employing 961 persons. It is also expressed in the EIS that leasing and development of the PRLA will not affect coal production in Northwest Colorado. Production will be about the same, with or without Consol's production, but with leasing of the PRLA, Consol will grab a share of the profits and contribute to the impacts. If Consol does not develope the project, regional production will remain at present levels, and the level of impacts will not be affected.

19-6 The two areas of the most significant unacceptable impact are water quality (particulary on James Creek) and on

19-6 cont. wildlife and the analysis of those impacts are inadequate. The ground water analysis, which is crucial to understand the true environmental impact of this project, is superficial at best. The DEIS states that "changes in aquifer properties and ground water flow patterns would result from disturbing the overburden during mining and subsequent mining reclamation efforts," but doesn't discuss to what extent those disturbances will occur and what the real damage will be. Have there been any Yampa River water quality studies done? What is the cummulative impact of coal production on river water quality to date and how will this coal production fit into the total picture? None of these issues are addressedin the EIS.

19-7 It seems obvious even with this inadequate analysis that there is no need to develop more mining operations such as Consol's PRLA. Leasing and development of the project would cause only negative impacts to air and water quality, land, wildlife, and the local economy, and the only benefits to be reaped would be those of profits for Consol. The additional coal production by Consol is unsolicited and unnecessary; present operations sufficiently satisfy or even exceed current and future coal production demands, while causing no further impacts of development to the region.

19-8 Leasing and development of the PRLA would cause nothing but adverse alterations to the environment, while bringing the only gains to Consol itself. The additional coal is not necessary; the detrimental impacts are not necessary. For a change, both man and nature are satisfied with the conditions of a region in question. The area should be left intact, and the PRLA should not be developed. It is obvious that the analysis of this PRLA is inadequate and the EIS must be redone. The absence of thorough ground water analysis and impacts on wildlife (particularly elk habitat) as well as the failure of the proposed alternative to adequately address the required mitigation measures makes it clear that the EIS does not give the public enough information on which to base a decision. We recommend at minimum that the EIS be redone and preferably that the no action alternative of this partial analysis be adopted.

Fe Baran
Fe Baran

Maggie Fox
Maggie Fox

19-1 This EIS is not the final permitting process for the PRLA. The Final Showing which will be submitted by Consol, is based in part, on the mitigation levels identified by this EIS.

The PRLA process does not allow BLM to take into account whether there "is a need for more coal production in Colorado" but rather, as the commentator correctly states, "whether revenues from the sale of coal will exceed the costs of extraction, reclamation, and mitigation."

BLM identifies through the EIS what type of mitigation and reclamation the lessee will be responsible for, should the lease be issued. In the final showing, the applicant must demonstrate that the lease terms can be met while still making profit from operation of the mine. BLM will review this information (there is also an opportunity for public review) and determine whether or not the data is reasonable. Then if the lease terms can be met and a profit can be realized, the lease will be issued. If the final showing indicates that compliance with the lease terms is economically infeasible, the PRLA will be rejected.

Please see Chapter 1 for additional information.

19-2 The commentor reiterates information provided on page 32 of the Draft EIS, but fails to include the following statements: "These results must be considered preliminary because of the assumptions applied in the screening analysis. Further, less upward based modeling may indicate lower potential impacts...standard lease stipulations would include strict adherence to all applicable state and Federal statues, laws, and regulations." Regulatory enforcement would not allow the predicted exceedance to occur.

19-2a Thank you for your comment.

19-3 Over the short term, grass species protect the soil surface; and initially, they provide better vegetative cover than either shrubs or trees. Grass cover will retain the soil and protect site productivity while shrubs and trees are becoming established.

In the long run, through natural encroachment of brush, the final composition will be similar to the surrounding areas.

In the long run, through direct revegetation, shrub reestablishment and natural encroachment of brush, the final composition will be similar to the surrounding areas (see Appendix D, Section 3.3.2).

We realize the importance of aspen and have suggested additional mitigation to improve the chances of aspen success.

19-4 Thank you for your comment.

19-5 Forage loss will be mitigated based on lost production, not necessarily on an acre for acre basis. Riparian habitat replacement is a lease condition and cannot be accomplished until final reclamation. Monitoring is an integral part of the Proposed Action and Preferred Alternative (see Appendix C), and would be used to ensure that no net loss of in-kind habitat value occurs.

19-5a You are correct. The projected production for northwest Colorado is based on demand. Various companies may compete to meet the demand. Please refer to the discussion in Chapter 2.

19-6 Because of the uncertanties involved forcasting the impacts on water quality from development, a range of the anticipated impacts has been presented. More detailed impact analyses will be done during the permitting process.

19-7 Please see the response to comment 19-1.

19-8 Thank you for your comment.

20

Working for the Nature of Tomorrow.
NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

February 5, 1988

Registered Mail

Greg Goodenow
Project Manager
Bureau of Land Management
455 Emerson Street
Craig, CO 81625

Re: Inadequacy of James Creek Coal Preference Right Lease Application (C-0126998) Draft Environmental Impact Statement Relative to 43 C.F.R. 3430, 52 Fed. Reg. 25,793-800 (July 8, 1987).

Dear Mr. Goodenow:

0-A The National Wildlife Federation (NWF), the Natural Resources Defense Council (NRDC), the Colorado Wildlife Federation and the Colorado Environmental Coalition, take this opportunity to respond to the Bureau of Land Management's (BLM's) request for additional comments on the adequacy of the November, 1985 James Creek coal draft Environmental Impact Statement (EIS) relative to the new procedures for processing Preference Right Lease Applications (PRLA's) promulgated at 43 C.F.R. 3430, 52 Fed. Reg. 25,793-800 (July 8, 1987). This is a PRLA by Consolidation Coal Company (CONSOL) for a 10 million ton-per-year surface mine near Meeker, Colorado. In particular, these comments address the ways in which the draft EIS fails to comply with the new agency regulations.

Our organizations have previously objected to the processing of the James Creek Coal PRLA (C-0126998) in violation of the National Environmental Policy Act and the court order in Natural

Resources Defense Council, Inc. v. Berklund, 458 F. Supp. 925 (D.D.C. 1978), aff'd, 609 F.2d 553 (D.C. Cir. 1979). A copy of the February 27, 1986 comments filed by NWF and NRDC is attached and incorporated herein by reference.

20-1 The draft EIS completely fails to comply with the new regulations governing the processing of PRLA's, thus precluding any meaningful comment. This is hardly surprising, in light of the fact that the James Creek draft EIS was completed more than one year and a half prior to the adoption of the new regulations. Unfortunately, the fact that BLM would even suggest that the James Creek draft EIS might comply with the regulations calls into question the extent to which the agency is prepared to follow its own rules, which were issued on the basis of protracted negotiations and a binding amended court judgment.

20-2 BLM's request for comments on this outdated draft is especially inexplicable in light of the fact that, as we were informed by a BLM employee on February, 3, 1988, CONSOL relinquished five of the leases surrounding the James Creek PRLA (C-93714, C-93715, C-93716, C-1546, and C-245) after the draft EIS was issued, thereby rendering it obsolete. The entire draft EIS is based upon a mine plan with overall, co-ordinated, sequential development of the PRLA and the relinquished leases by a single applicant. 20-3 Since the mine plan area examined by the original draft is now owned by two different corporations, both with contractual and Mineral Leasing Act obligations with the government to develop coal mines on the property or face forfeiture of their lease rights, the draft EIS should consider

0-3 that two mines will be operating in the area simultaneously, not one. This will clearly affect the entirety of the draft EIS's analysis, in particular the potential impacts upon the environment from coal mining in this area. Further, it will exacerbate the cumulative impacts upon wildlife, air quality, water quality, water availability, and other sensitive resources from the mining of the PRLA and require much more stringent mitigation requirements and stipulations. However, without the appropriate information and analysis, commenting upon the document is difficult if not impossible. Therefore, a new draft EIS should be issued reflecting the change in status of the lands under examination in the James Creek document.

0-4 The change in ownership also drastically alters the analysis of the economic feasibility of the PRLA. BLM's prior analysis explicitly predicates development of the James Creek PRLA on CONSOL's ability "to capture a large share" of the market, thus enabling it to compete. James Creek Draft EIS at 13-14. Now, CONSOL's ability has been dramatically changed by the reduction of the size of its mine plan area and by the addition of another competitor simultaneously mining and selling similar coal in the same market. Current analysis of the economics of the coal market is needed to determine whether CONSOL's development of the remaining portion of its James Creek leases would be economically feasible. Marketing new coal on a saturated market would drive prices down, reduce or eliminate CONSOL's profit margin and limit the resources available for reclamation. Hence, more information about the present and anticipated coal markets, including the

foreseeable development of other leases and PRLA's, is vital to the commercial quantities determination.

20-5 The draft EIS failed to identify or examine any specific methods or plans for the permitting, mining, and reclamation of the James Creek site. The lack of vital planning information will prevent BLM from compiling accurate economic estimates for the costing document in contravention of the purpose of the new rules. Pursuant to Section 3430.4-3(b) of the new regulations, the "authorized officer shall provide for public review of the costs of environmental protection ...."

20-6 The purpose of BLM's new regulations is to ensure the availability of detailed cost information germane to each alternative plan prior to the determination of the existence of 20-7 commercial quantities of coal. Under Section 3430.3-2(c)(1) of the new rules, the authorized officer "shall prepare adequate environmental impact statements ... to assure ... that the full cost of environmental impact mitigation, including site-specific lease stipulations, is included in the commercial quantities determination for that preference right lease application." 20-8 The EIS must evaluate alternatives that explore different ways to minimize the environmental impact, and the "impact analysis shall address each numbered subject area set forth in § 3430.4-4 ...." Id. at Section 3430.3-2(c)(2). These numbered subject areas are a variety of specific costs of permitting, mining and reclamation that must be included by the authorized officer prior to a commercial quantity determination.

20-9 By its own admission, BLM did not plan on creating a cost

20-9 cont. document estimating the cost of environmental protection and reclamation costs when it prepared the James Creek draft EIS. After identifying the three major phases of the processing requirement -- initial showing of a commercial quantity of coal, environmental analysis and the final showing -- BLM wrote:

> This environmental impact statement will satisfy the second step (environmental analysis) of the processing procedure. When preparing the final showing, the applicant will consider the costs of complying with the stipulations and mitigation measures identified in this [environmental impact statement].

James Creek Draft EIS at 4.

This draft EIS is a legally insufficient basis for calculation and public review of, and comment on, the costs of environmental protection. The lack of specific proposals for

20-10 planning, mitigation and reclamation makes it impossible for BLM to issue a viable cost document, i.e., one which complies with the new rules by presenting reasonably accurate estimates of the costs of mitigating impacts on the environment. Such accuracy is essential for the process to result in a decision that will withstand scrutiny and legal challenge-- whether by the applicant or by others. The Council on Environmental Quality's regulations

20-11 and BLM's own new rules require that BLM provide a new draft EIS that complies with these regulations before we can be in a

20-12 position to submit meaningful comments. Failure of BLM to issue a new draft EIS which conforms with the new regulations would be a reckless disregard of the Court's holding in Berklund and of its own regulatory requirements.

20-13 The costs of information analysis, mitigation and reclamation are essential to BLM's determination of commercial quantities, and hence to its decision as to whether to grant the

20-14 lease. Therefore, inadequate information in the draft EIS which prevents the applicant, agency and the public from deriving cost estimates, renders the commercial quantities equation (profit from mining less environmental protection and other costs) unworkable. For the James Creek PRLA, the need for this cost information is best illustrated by the potentially severe environmental impacts identified by BLM in the draft EIS. These include, but are not limited to, those areas specifically mentioned in the draft EIS as major areas of concern, including wildlife, water resources, and reclamation. James Creek Draft EIS at 7.

20-15 For example, although BLM admitted that the impact of the proposed mining on the elk who live in the James Creek area was a serious concern, it supplied no information concerning the

20-16 economics of permitting, mitigation, or reclamation. The baseline survey of elk winter habitat, crucial for determining what mitigation and reclamation efforts would be necessary, was conducted during an abnormal winter. BLM admitted that "[d]uring the winter of 1983-84, the majority of the project area was not available as winter range because of heavy snow cover. This was an extremely severe winter and is not indicative of a normal winter." James Creek Draft EIS at 63 (emphasis added). An

20-17 inaccurate baseline analysis clearly affects the choice of mitigation and reclamation efforts required by law, not to

mention the potential impact on the elk herds.

20-18 The draft EIS proposed off-site enhancement as one method of mitigation. Without a more thorough analysis of this plan, which

20-19 should include total acreage proposed and the cost per acre for enhancement, a decision as to preferred mitigation will be

20-20 improperly left to the applicant. That is, failure to examine detailed alternative mitigation methods so that the agency can select those that are appropriate constitutes an abdication by BLM of decision-making responsibility to the applicant, which will choose on the basis of cost, not effectiveness. Similarly, as discussed below, the draft EIS proposed no detailed plan for reclamation to protect and restore the elk habitat. Since these costs can be quite substantial, more data are needed before any person or organization can comment on the feasibility or adequacy of the proposal.

20-21 BLM's draft EIS also identified potential harm to the water resources of the James Creek area. According to the survey of surface water, approximately 60 percent of the James Creek watershed would be mined, and the current hydrologic regime of the James Creek watershed would be altered. The survey also estimated that "between 40 and 400 years would be required before the headwaters of James Creek received baseflows from the spoil aquifer." James Creek Draft EIS at 47. Based on these observations, BLM concluded that "[t]he combined overall effect would significantly alter the present hydrologic characteristics of the James Creek watershed." Id. In addition, BLM found that because of the potential damage to the area groundwater, the

"[i]mpacts to water rights in the project area and its general periphery could require compensation to the owners." James Creek

20-22 Draft EIS at 54. In both cases, BLM failed to offer any concrete explanation or suggestions as to how, if at all, mitigation and reclamation may be achieved. Indeed, BLM implies that some water quality degradation is unavoidable. E.g., "Increased TDS contributions to the Colorado River Basin would be irretrievable." Id. at 48. The threat of long term adverse

20-23 environmental impact on the water supply evinces the need for specification of the method of compensation to the owners of water rights, the mitigation efforts to reduce the surface water recharge, and the mitigation plans to assure protection of elk herd water supply, so that applicable costs can be calculated on a reasonably definite basis.

20-24 Instead of examining mitigation methods to determine whether mitigation of these impacts is possible, and what specific actions would be required of the potential lease holder, BLM relied upon vague and generally hortatory lease stipulations to resolve the problem. For example, the proposed action in

20-25 Appendix C (id. at 125) would include in the lease the following stipulation: "The lessee shall emphasize minimizing impacts to James Creek channel and floodplain." This language established no standards to be achieved regarding water quality, and is vague and unenforceable. Where a few specifics were suggested, the use of buffer strips and terrace slopes, their effectiveness in mitigating impacts was not analyzed and the specific standards and boundaries were left to be determined "during the mine

permitting process." Finally, other issues were simply left
unresolved, for example, the re-establishment of perennial seep
20-25 areas. The proposed action would require the lessee to "study
the possible re-establishment of perennial seep areas and
establish them if practicable." *Id.*

This approach to mitigation and stipulations is not unique
to water quality impacts. In other areas, the proposed actions in
20-26 Appendix C are equally vague, unenforceable, unjustified and
unsupported, or simply non-existent. For example, impacts to
groundwater were defined in the draft EIS (at 54); yet, no
mitigation was offered in the proposed action. Paleontological
20-27 resources and cultural resources were left to be studied in the
mine plan (stipulation 5.A.). Impacts to the dozens of raptor
nests observed in the area (23 of which have not yet been
identified for a specific species) will not be permitted,
20-28 according to the stipulations. Yet, site specific plans to
determine how to avoid such adverse impacts were left to some
indefinite time in the future when the lessee consults with the
U.S. Fish and Wildlife Service and the Colorado Division of
Wildlife. Clearly, the mitigation costs cannot be estimated for
20-29 the commercial quantities test with any accuracy without
prejudicing the authority of these agencies in the future.
Furthermore, the apparent underlying assumption of perfect
compliance with, and state and federal enforcement of, the
20-30 current language of the Surface Mining Control and Reclamation
Act of 1977 and other environmental statutes is inconsistent with
the numerous outstanding and unabated violations of these

statutes. *See, e.g., James Creek draft EIS at 32-33.* This
approach is also in conflict with the court's recent holding
regarding the need for third party commitments to mitigation in
20-31 *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d
810, 819-20 (9th Cir. 1987), a copy of which is attached and
incorporated by reference. At a minimum, reclamation and other
environmental provisions that are the basis for assumed
mitigation should be included as independent lease stipulations,
20-32 so that BLM will have independent, direct enforcement authority.
Other examples of the inadequacies of the proposed action in
Appendix C abound. However, these specific examples should
20-33 suffice to demonstrate the severe inadequacy of the approach with
this document takes throughout Appendix C.

Incredibly, the draft EIS never mentions the presence of the
Jensen State Wildlife Area within the PRLA boundaries. Although
Map 3-11 "Surface Land Ownership," at 73, indicates a sizable
tract owned by "Colo. Div. of Wildlife," and Table 3-12
20-34 "Approximate Acreages of Landownership Within the PRLA," at 72,
lists "Division of Wildlife" as owning 2,250 acres, this acreage
is discussed and classified solely as "rangeland." *Id.* at 71-72.
20-35 We submit that the Jensen State Wildlife Area should be
considered unsuitable for mining.

The proposed elk habitat replacement plan provided by CONSOL
is entirely deficient. To a large extent, the habitat
replacement plan is dependent upon CONSOL's purchasing or leasing
20-36 lands in sufficient quantity to mitigate mining imapcts on a
schedule that anticipates actual surface disturbance. This

strategy assumes that: 1) suitable land exists nearby, and 2)
that the present owner will be willing to sell or lease the land.
Suitable elk habitat may not exist nearby and present owners may
not sell or lease their land. *See Methow Valley Citizens Council
v. Regional Forester*, 833 F.2d at 819-20. These issues should be
20-37 resolved now, in the revised draft EIS, not deferred until the
mine plan stage. Otherwise, the fundamental tenet of the
mitigation plan could prove to be faulty.

Moreover, the mitigation plan stated that "As a basis for
mitigation planning (including land acquisition and estimation of
mitigation costs), *an acre for acre replacement ratio* for
impacted elk habitat has been assumed." *Id.* at 135 (emphasis
added.) Depending upon how BLM defines the impacted habitat, we
20-38 may strenuously disagree. If, as we presume, BLM defines
impacted habitat as that immediately disturbed by mining, this
would drastically underestiamte the extent of the impact upon the
elk habitat.

The Wyoming Game and Fish Department has continuously
monitored the response of elk to disturbance in the Riley Ridge
Natural Gas Field. While the development in this area is
somewhat different - natural gas - it would generally have less
20-39 impacts than surface mining of coal, or even underground mining.
The terrain in the area studied is similar, and the habitat
values are very similar to that being examined by the James Creek
draft EIS. According to the Wyoming Game and Fish Department's
most recent report, a copy of which is attached and incorporated
herein by reference, the impacted habitat should be multiplied by

a factor of perhaps 97! Clearly a one-to-one replacement ratio
is unsupportable, and will protect only a small fraction of the
elk habitat potentially disturbed. A greater than acre-for-acre
replacement ratio should be employed as the basis for mitigation
20-40 planning and estimation of costs, one based upon the best and
most recent studies. This would result in a ratio of somewhere
between 20 to 1 and 97 to 1; more extensive analysis should
refine the exact value. In addition, the plan should recognize
that calving habitat values will be lost anywhere within a one
mile radius of disturbance or human activity.

CONSOL's mitigation plan stated, "...it appears that off-
site enhancement needs (Table 3-2) for calving habitat can be met
20-41 by the supply of existing off-site calving areas." *James Creek
draft EIS* at 135. This is unsupportable, especially given the
lack of data in CONSOL's plan.

Elk displaced by mining may be able to utilize the existing
Hole-in-the-Wall Calving Unit and the South Calving Unit.
However, these areas may be at, or near, carrying capacity and
thus not be able to accomodate displaced elk. In the past, BLM
20-42 has averred that virtually all critical elk calving habitat in
the Green-River Hams-Fork Coal Region is at capacity, (*See*, BLM's
Draft Regional Coal Leasing EIS, 1984). No data was included in
the James Creek draft EIS regarding the carrying capacity and
utilization of these areas. Such information is essential before
the effectiveness of this partial mitigation can be assessed,
20-43 however, it appears that BLM's prior assertions would indicate
that this mitigation is not feasible.

20-44 The three other primary calving units identified are the Little Creek, East, and Yellow Jacket Calving Units. James Creek draft EIS at 137. Little Creek and East Calving Units lie immediately adjacent to the proposed mine area. For the East Calving Unit, only 24 acres of the unit's 927 acres were identified as elk calving areas. Of the Little Creek Unit's 309 acres, 0 acres were identified as elk calving areas. These areas are very small relative to the size of the Hole-in-the-Wall and South Calving Units. Only 24 of the combined 1,236 acres of these two units were even identified as elk calving areas. Id. Furthermore, their proximity to the proposed mine -- immediately adjacent to it -- raises serious doubts about the reality that these two units will continue to provide effective elk calving habitat.

20-45 CONSOL identified zero acres in the Yellow Jacket Calving Unit as elk calving areas. Id. There is no data on the extent of existing vegetation on this unit. A footnote to Table 3-4, Appendix D, stated that this area was outside the intensive study area. Thus, despite 0 acres having been identified as elk calving areas, and despite a complete lack of data on the existing vegetation and habitat values of the area, CONSOL nevertheless proposed this area as a primary calving unit. This is unsupportable.

20-46 Similar deficiencies exist with the three units identified as Secondary Calving Units. These units are Clear Creek, Mill Creek, and Aldrich Lakes. Id. All three were excluded from vegetative and habitat study and mapping in Table 3-4, Appendix

20-46 cont. D. In addition, in each of the three units, 0 acres were identified as elk calving areas. If 0 acres are identified as elk calving areas, and the surface vegetation and habitat is not known, how can these areas legitimately be proposed as secondary calving units?

20-47 To summarize: the elk mitigation plans has several fatal flaws: (1) the brief study period and atypically severe winter used to design mitigation; (2) the unsupported assumption that suitable nearby lands exist for mitigation and will be sold or leased by the current owner; (3) the acre-for-acre replacement ratio, which is a severe understatement of the potential impacts on elk habitat; and (4) a completely speculative reliance upon proposed primary and secondary calving areas for which no data, or inadequate data, has been provided.

20-48 The glaring inadequacies of the mitigation plan are even more alarming when one reads the proposed stipulations. They would allow mining of the critical elk habitat areas once certain conditions are met: the habitat disturbed by mining has returned to its premining value, and disturbance is compensated for by some form of mitigation. James Creek draft EIS at 120. The stipulations reference to "those areas shown and described in the legend of figure 3-1 of Appendix C," id., included all of the elk impact avoidance areas which BLM's analysis and CONSOL's proposed mitigation plan states will not be mined! If these areas are to be included in any proposed coal lease and allowed to be mined, the anlaysis must reflect the impacts of such mining and define specific mitigation for the impacts to the elk

20-48 cont. habitat. Otherwise, this stipulation should explicitly prohibit mining under any circumstances. In fact, lands which are unsuitable for mining under any circumstances should be eliminated from any proposed lease tract.

20-49 Given these serious problems and deficiencies, the James Creek draft EIS does not contain an effective and supportable elk mitigation plan. BLM must re-examine this question in its entirety, and re-propose an elk mitigation plan as part of the new draft EIS.

20-50 While BLM mentioned reclamation as a major area of concern in the draft EIS, it did not attempt to address the problem in a systematic way. In the vast majority of cases, the specifics of reclamation schemes were deferred until the mine planning stage. For example, identification and design of specific measures to reduce the impact to the water resources were deferred until the mine planning stage, even though BLM admitted that some of the designs are experimental and not proven. James Creek Draft EIS at 22-23. BLM also deferred both the gathering of baseline data for aspen reclamation and the development of measures to avoid unstable slopes or soils until the permit application process. Id at 22, 27. Identification of impacts to raptors was deferred to "the earliest possible date," which presumably has now passed, and raptor mitigation was delayed until the permitting process. Id. at 22, 26. These and other delays are now unlawful under the

20-51 new agency regulations and the National Environmental Policy Act. See Methow Valley Citizens Council v. Regional Forester, 833 F.2d at 819. Reclamation is the most expensive and controversial

20-52 aspect of surface mining from both an environmental and industry standpoint; the revised draft EIS must analyze the details of mitigation that will be the basis for calculation of costs for the commercial quantity determination..

20-53 Further, the new regulations require that "[a]t a minimum, each environmental impact statement shall include:" a "no action" alternative, the applicant's proposed action, the officer's proposed action, an exchange alternative, and a withdrawal and just compensation alternative. Section 3430.3-2(c)(2). All

20-54 draft EIS's must examine these alternatives separately, taking into account the subject areas set forth in Section 3430.4-4 of the new rules so that the alternatives can be compared on the basis of environmental, economic and other costs. BLM, in the

20-55 preamble to the new rules, recognized the legal duty to examine separately each alternative. 52 Fed. Reg. at 25,794. Not only did the draft EIS fail to address environmental protection cost factors, but it also lacked a separate analysis of each

20-56 alternative. BLM collectively examined "no action," exchange and compensation/withdrawal alternatives solely on the basis of environmental impact. Granted all three alternatives result in no environmental harm in the James Creek area, but they have

20-57 different environmental impacts in other areas. Exchange of the James Creek PRLA for lease rights to other lands would have

20-58 environmental effects in the new area if it were developed. Also, there are economic differences between the alternatives.

20-59 The James Creek draft EIS also failed to provide a cumulative impact analysis as required by section 3430.3-2(c)(3) of the new rules. According to this section, the cumulative impact analysis must examine "the impacts of the proposed action and the alternatives when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or person undertakes such other actions." Regarding coal leases in particular, the rule states, "[t]he cumulative impact analysis shall include an analysis of the combined impacts of the proposed preference right leasing with the mining of currently leased coal and other reasonably foreseeable future coal development, as well as other preference right leasing in the area under examination." (emphasis added). Id. at 3430.3-2(c)(1)(i). 20-60

Under the new regulations, BLM has to consider cumulative impacts in all draft EIS's. Thus, a valid draft EIS for James Creek must include in its cumulative impact analysis a discussion of possible harm that might result from the development of nearby leases and PRLA's. 20-61

In light of the recent release of the Northwest Colorado Coal Preference Right Lease Applications Draft EIS (NWCC), dated January, 1988, which identifies several areas of potentially severe environmental impact, it is clear that BLM failed to include the requisite cumulative impact analysis in the James Creek Draft EIS. The NWCC PRLA's include a proposed coal lease, Jensen-Miller, located approximately three miles from the James Creek area, which is highly likely to have an impact on the surrounding environment should it be developed. These remarks are in no way intended to be comments on the NWCC draft EIS, 20-62

which we have not yet had an opportunity to analyze fully and on which the comment period is open until April 29, 1988. Examples of possible environmental harm taken from the NWCC draft, however, help to illustrate the need for a thorough cumulative impact analysis for the James Creek area. 20-62 cont.

In the James Creek draft EIS, BLM identified White River elk winter habitats as an area of particular concern; therefore BLM was required to examine the potential effect of the development of nearby PRLA's on this vital resource. 20-63

The NWCC draft EIS for Jensen-Miller identifies 200 acres that have been declared unsuitable for mining because they are critical winter ranges for the White River elk herd. NWCC Draft EIS at 6-12 to 13. BLM, however, is recommending that this classification be altered to allow mining of some of these areas. Id. at 4-16. The possible loss of these and other areas might have a profound impact on the elk herd which could be exacerbated by careless planning of the James Creek PRLA. 20-64

Even if, assuming arguendo that either James Creek or NWCC alone does not affect unacceptably the critical winter ranges of the elk herd, taken together these two leases are potentially disastrous. Thus, a valid James Creek draft EIS must consider the cumulative impact on the elk herd from development of the NWCC PRLA's and any other reasonably forseeable coal development in the area. 20-65

The combined development of the James Creek and NWCC PRLA's, both of which are part of the Colorado River System, could have a significant impact on the hydrology of the area. According to the NWCC draft EIS, "[i]f total inflow exceeded the consumptive 20-66

use of water in the mining operations, a National Pollutant Discharge Elimination System permit would be required for the discharge of mine effluent." NWCC Draft EIS at 4-5. Because of the close proximity of these PRLA's, the revised James Creek draft EIS should address the same question of excess consumptive use. 20-67

Consumptive use also threatens the habitat of the squawfish and the humpback chub, both of which are endangered species. BLM, in the NWCC draft EIS, concluded "that any consumptive use of surface or groundwater obtained from the Colorado River Basin constitutes an ultimate loss or alteration of flow in the Colorado River system, and is detrimental to downstream aquatic conditions comprising suitable habitat for Colorado squawfish and humpback chub." NWCC Draft EIS at 4-6 (emphasis in original). 20-68

As a result, "[c]ommensurate with a 'may effect' [sic] determination for Colorado squawfish and humpback chub, BLM must perform formal [Endangered Species Act] Section 7 consultation with USFWS [the United States Fish and Wildlife Service] prior to approval of the mine plan." Id. Clearly, the cumulative impact analysis in the revised James Creek draft EIS must address the question of consumptive use and discuss what impact, if any, the development of James Creek would have if the NWCC PRLA's are mined. 0-69

Moreover, there is no discussion or consideration of the question of CONSOL's eligibility for the James Creek PRLA. In particular, we understand that CONSOL may be in possession of coal leases that have not been developed within the time required -70

by Section 3 of the Mineral Leasing Act, and as such CONSOL might not be eligible for a federal coal lease. There is also no consideration that CONSOL's other federal leases in this mine plan area may be subject to termination under Section 7 of the Mineral Leasing Act, which issue is pending on motion for summary judgment in the case of Natural Resources Defense Council, Inc. v. Burford, Civ. No. 82-2763-WBB (D.D.C.). CONSOL may also be ineligible if it has the requisite ownership or control relationship with regard to a outstanding or unabated violation of the Surface Mining Control and Reclamation Act of 1977. The agency clearly has an obligation to investigate these matters and to address them fully in a re-issued draft EIS which can serve as a basis for meaningful public comment. 20-70 cont.

The James Creek draft EIS totally fails to comply with the new regulations resulting from the court's decision in NRDC v. Berklund. 20-71

Massive changes in the proposed mining plan resulting from CONSOL's relinquishment of five of its James Creek leases must be discussed by BLM in depth, with full opportunity for public comment. 20-72

The dearth of information in the draft EIS on the permitting, mitigation and reclamation of the mine will preclude BLM from developing the realistic cost estimates required by law. 20-73

BLM failed to consider in any detail the specified alternatives and their concommitant costs, thus rendering impossible a comparison of, and meaningful public comment on, the alternatives. 20-74

The James Creek draft EIS also failed to provide the specific mitigation and other information required by the rules, from which costs can be derived readily by 20-75

20-75 cont. the applicant, the agency and the public. Proposed mitigation is based upon inadequate data, unsupported assumptions, and analysis

20-76 that conflicts with the National Environmental Policy Act and the specific requirements in BLM's own new regulations governing

20-77 processing of PRLA's. Finally, this draft EIS did not address the serious problem of cumulative impacts that may result from the concurrent development of neighboring leases and PRLA's.

20-78 Therefore, a new draft EIS that complies with the requirements of the new agency regulations must be prepared.

Sincerely,

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Natural Resources Defense
Council

Glenn P. Sugameli, Esq.
National Wildlife Federation

Eric H. Imperial, Legal Intern
National Wildlife Federation

Kirk Keopsel
Colorado Environmental
Coalition

Reed Kelly
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Encl. (3)
cc w/ encl.: The Hon. Robert Burford
Director, Bureau of Land Management

NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

February 27, 1986

Bureau of Land Management
Greg Goodenow, Project Manager
455 Emerson Street
Craig, Colorado 81625

Dear Mr. Goodenow:

On February 8, 1983 and May 2, 1983, our organizations informed the Department of the Interior and the Bureau of Land Management that Preference Right Lease Applications were being processed in violation of the National Environmental Policy Act and U.S. District Court Judge June L. Green's Order of June 30, 1978 in Natural Resources Defense Council, Inc. v. Berklund, (Civil Action No. 75-0313, U.S. Dist Ct., Dist. of Columbia.) Copies of these letters are attached and incorporated herein.

As you know, we are having continuing discussions with the Department of the Interior and the Department of Justice regarding the concerns outlined in these letters. During the pendancy of these discussions, we object to the Bureau of Land Management taking any further action on the James Creek Coal PRLA (C-0126998).

We have reviewed the draft EIS on this PRLA and have concluded that it fails to comply with the National Environmental Policy Act and the above mentioned Court Order. It does not resolve the issues detailed in our previous communications with the Department of the Interior, despite the fact that the document is called an Environmental Impact Statement rather than an Environmental Assessment.

We are particularly concerned with the document's examination of the potential impacts of development of this PRLA to ground and surface water, wildlife, and soils. For each of these potentially impacted resources the data upon which the draft EIS is based appears to be weak or questionable, the mitigation proposed is speculative with key decisions being deferred for future resolution, and no analysis of alternative mitigation measures appears to have been conducted.

For example, the document's analysis of impacts to critical elk habitat are based upon data obtained during atypically severe 1983-84 winter. The elk habitat mitigation plan relies upon an acre-for-acre replacement ratio, which appears dramatically low based upon recent studies conducted by the Wyoming Fish and Game Department. The mitigation plan also relies upon the unsupported assumption that suitable land exists nearby and that the present owner(s) will be willing to sell or lease such land.

Further, the document does not demonstrate that any analysis has been conducted of alternative mitigation techniques for the potentially significant impacts to elk habitat. Instead, it relies almost exclusively upon one proposal.

We also note that the document does not provide an adequate analysis for purposes of conducting the commercial quantities test required of a PRLA. In several instances, such as impacts to paleontological and cultural resources, the document defers collection of significant data. The inventory data for these resources must be available as part of the EIS. Moreover, without such data potential impacts cannot be determined and commercial quanitities cannot be determined.

For all of the proposed mitigation, no costs are developed which would allow the public to participate in the critical questions surrounding issuance of a federal coal lease.

Finally, the proposed lease stipulations do not appear to provide for effective enforcement of the proposed mitigation in the document. For example, while the entire analysis of potential impacts to elk habitat assumes that large portions of the study area will not be mined, the proposed lease stipulation could allow mining of these areas. Either the stipulation must be revised to reflect the analysis of the EIS, or the analysis of the EIS must incorporate an analysis of full development of these lands. We also question why the BLM has not considered the alternative of excluding lands which it considers unsuitable for mining from any lease which is subsequently issued.

The draft EIS also does not include an analysis of potential cumulative impacts upon the environment. This particular lease poses unique cumulative impact questions, particularly to water and wildlife resources. Yet no analysis of cumulative impacts is included.

In addition to the above concerns, it appears that the BLM has violated its regulatory obligations to apply the unsuitability criteria to these lands during preparation of the White River Resource Area Management Framework Plan. Nor is it clear whether this document is an amendment to that Plan, or whether subsequent actions will be required to apply the unsuitability criteria to these lands. These are critical questions for many of the assumptions made in this analysis.

The BLM also does not take into consideration the diligence status of the federal leases involved in the study area. It appears that these leases may be subject to enforcement actions and/or cancellation due to the failure on the part of the Consolidation Coal Company to diligently develop these leases. These events would have a major bearing upon the environmental analysis, and upon any commercial quantities determination.

While our organizations wished to inform you of our concerns about this draft EIS, we wish to re-iterate our objections to the BLM's taking any further action on this document or the PRLA at this time. We believe that the comment period on this draft EIS must be extended until at least 30 days after our current discussions with the Department of the Interior and the Department of Justice are completed. Based upon our recent discussions with the Department of the Interior, we understand that our detailed comments on the draft EIS will be accepted at such a future date.

Sincerely,

Karl Gawell
National Wildlife
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Johanna Wald
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Enclosures: 2

cc: Assistant Secretary Griles

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February 8, 1983

Mr. Robert L. Burford, Director
Bureau of Land Management
18th and "C" Streets, N.W.
Washington, D.C. 20240

Dear Mr. Burford:

As you know, the Natural Resources Defense Council, Inc. (NRDC) and the National Wildlife Federation have long been concerned about the handling of preference right lease applications (PRLAs). As you may also be aware, both organizations have recently been reviewing numerous documents involving PRLAs provided to us by state Bureau of Land Management (BLM) offices. Based on our review to date, we have reached the conclusion that the BLM is making a number of serious errors in its processing of PRLAs, particularly in its attempts to comply with the relevant requirements of the National Environmental Policy Act (NEPA). We are writing to inform you of the errors we have identified and to urge you to halt the further processing of all PRLAs until you are able to develop a program that clearly remedies these problems.

Our review indicates that the BLM is failing to prepare environmental impact statements (EISs) in circumstances where issuance of PRLAs would be major federal actions significantly affecting the environment. In many cases, the environmental assessments (EAs) that have instead been prepared clearly demonstrate that NEPA's threshold criteria for requiring EIS preparation are met. In many other cases, the contents of the EAs that have been prepared suffer from a variety of inadequacies. These include inaccurate and incomplete descriptions of environmental impacts; ill-defined and insufficient proposals for mitigation measures; unduly limited discussions of alternatives to the proposed action; superficial recommendations for lease terms; and inadequate opportunities for public comment.

For example, in most cases, discussions of project alternatives are limited to "no action" and "lease issuance," with no consideration of delay, lease exchange, lease cancellation or withdrawal. In many of the EAs, the recommendations

for lease terms consist simply of a reference to the relevant statute or regulation. In some cases, the descriptions of environmental impacts fail to address socioeconomic impacts and reclaimability.

In general, the EAs do not contain the information needed to make the commercial quantities determination required by the Mineral Leasing Act and NEPA. Indeed, none of the EAs contain estimates of the cost of compliance with lease terms, as is necessary in order to make the commercial quantities showing.

Finally, our review suggests that the BLM is failing to determine the validity of the prospecting permits on which the PRLAs were based, including those in areas long recognized for their coal potential, where evidence suggests that the permits were improperly granted. Certainly, none of the documents that we have reviewed examine the validity of the permits involved.

It is clear from our review of the environmental analyses and from our conversations with BLM staff that the BLM has no comprehensive program for administering PRLAs in general or, more specifically, for conducting the environmental review required by NEPA. While we intend to supply further details regarding the problems outlined here in the near future, the evidence we have compiled clearly demonstrates the need for such a program. As you may recall, the preamble to the Interior Department's new coal leasing regulations acknowledged the need to develop procedures for the handling of PRLAs. See 47 Fed. Reg. 33114, 33126 (July 30, 1982). Consequently, we strongly recommend that you halt the processing of PRLAs until a systematic method has been established for evaluating the validity of the prospecting permits, performing the requisite environmental analysis, and determining whether the statutory prerequisites for lease issuance have been met. Given the current state of the coal market, the hasty disposition of PRLAs is no longer desirable for the government or, undoubtedly, to the applicants themselves.

In closing, we wish to express our appreciation for the cooperation we have received from the state offices in sending

the documents requested thus far. We request that in the future the BLM send us regularly all available documents pertaining to the processing of PRLAs.

Very truly yours,

Norman L. Dean lk
Norman L. Dean

Laura B King
Laura B. King

Karl Gawell lk
Karl Gawell
NATIONAL WILDLIFE FEDERATION

Johanna H Wald
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NATURAL RESOURCES DEFENSE COUNCIL, I

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May 2, 1983

James G. Watt, Secretary
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18th and C Streets, N.W.
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Robert F. Burford, Director
Bureau of Land Management
U.S. Department of the Interior
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Re: Natural Resources Defense Council, Inc. v. Berklund, (Civil Action No. 75-0313, U.S. Dist. Ct., Dist. of Columbia)

Gentlemen:

You have been advised by my clients, the Natural Resources Defense Council and the Environmental Defense Fund, and by the National Wildlife Federation of serious, widespread violations of law in the Bureau of Land Management's (BLM) current review of preference right lease applications (PRLAs) and its proposed issuance of such coal leases.

The violations are in direct and apparent willful disobedience of U.S. District Judge June L. Green's Order of June 30, 1978, in the above-captioned action (copy attached), which specifically enjoined the Secretary from issuing preference right coal leases, that constitute major federal action and significantly affect the environment, "unless he first prepares an appropriate Environmental Impact Statement (EIS)." NRDC v. Berklund, 458 F. Supp. 925, 928-29 (D.D.C. 1978); aff'd, 609 F.2d 553, 555 n.3 (D.C. Cir. 1979).

As outlined in our February 8 letter and as further detailed here, the current PRLA program wholly contravenes Judge Green's Order. My clients are more than willing to meet with you and discuss constructive steps leading to compliance with the Order. However, given the imminence of these leases, unless I hear from your representatives before May 13, 1983, I am instructed to return to Court to enforce the Order through appropriate contempt proceedings against you.

The EISs ordered by the District Court are no mere formalities; they are critical to the decisions you are required by Congress to make. The preference right coal leasing program has always been a very narrow exception to the Congressional policy of planned, competitive allocation of the public's coal resources. Mineral Leasing Act of 1920, 30 U.S.C. § 201 (Supp. V, 1981), as amended by the Federal Coal Leasing Amendments Act of 1975. Because Congress specifically requires that "commercial quantities" be found, before one of these exceptional, "preferential" leases can be issued (former 30 U.S.C. § 201(b)(1976)), the EIS has a unique role in this program. Until the Secretary knows, from a site-specific analysis, what the environmental costs of development are, he cannot determine whether "commercial quantities" have been found. The EIS is the indispensable source of data and analysis for this "commercial quantities" determination.

Further Details of the Violations

Our February 8 letter promised further details of the legal violations encountered in the PRLA program. NRDC has reviewed 28 BLM environmental documents* covering some 130 PRLAs, involving over 310,000 acres in Colorado, Montana, New Mexico, Utah, and Wyoming, impacting 10 wilderness study areas, and aggregating over 6,000,000,000 tons of recoverable federal coal reserves.

The uniform pattern revealed by these documents is one designed, rather crudely, to evade the District Court's Order as follows:

> 1. Preparation of a short, superficial environmental assessment (EA) on the PRLA(s);
>
> 2. A finding that issuance of a lease to mine will have "no significant effect on the environment"; and
>
> 3. Complete failure to prepare the thorough environmental impact statement (EIS) contemplated by the Order.**

---

* The environmental documents were provided by BLM in response to NRDC's Freedom of Information Act requests filed November 18, 1982. We appreciate the thoroughness and consideration shown by the BLM Offices in their responses and assume we have been provided all environmental documents prepared to date.

** Ironically, in one case BLM has even been inconsistent with its evasion scheme by preparing an EIS on PRLAs. Savery (Wyo.-Colo.) Final EIS, W-0324034, W-0324035, W-0324036, W-0324038, W-0324041, W-0324042, C-3605, C-3606. Two other PRLAs were cursorily examined in an EIS which covered multiple other coal developments (Meeker (Colo.), C-0126997, C-0126999) and another 26 were examined non-site-specifically in the San Juan River (N.M.) Regional Coal Draft EIS.

In part, this arbitrary avoidance pattern by State and District BLM Offices is attributable to lack of central guidance from your offices. As

[footnote continued next page]

This is an egregious violation of BLM's obligation to prepare an EIS on each preference right lease project. It is simply too late in the day to argue that federal leasing of coal mining rights is not a "major Federal action significantly affecting the quality of the human environment." Section 102(2)(C), National Environmental Policy Act (NEPA), 42 U.S.C. § 4332(2)(C).

Court cases have consistently held such coal leasing to be major federal action significantly affecting the environment. Kleppe v. Sierra Club, 427 U.S. 390, 399-400 (1976) (Interior "do[es] not dispute this requirement" of EISs for issuance of coal leases in the Northern Great Plains); Davis v. Morton, 469 F.2d 593, 596 (10th Cir. 1972); Cady v. Morton, 527 F.2d 786, 793 (9th Cir. 1975); NRDC v. Hughes, 437 F. Supp. 981 (D.D.C. 1977), as modified 454 F. Supp. 149 (D.D.C. 1978); and see National Indian Youth Council v. Watt, 664 F.2d 220, 223 (10th Cir. 1981) (two EISs for one coal lease).

Moreover, the Departments of the Interior and Justice have consistently told the courts this was their firm position:

> Clearly, the issuance of a federal coal lease of any substantial magnitude or in an environmentally sensitive area is a "major federal action significantly affecting the quality of the human environment," within the meaning of Section 102(2)(C) of NEPA, 42 U.S.C. 4332(2)(C).

Brief for the Federal Appellees at 32, NRDC v. Berklund, 609 F.2d 553 (D.C. Cir. 1980); accord, 609 F.2d at 555 n. 3. The government's brief further advised the Court:

> The setting of lease terms is an essential administrative action prior to the issuance of a [preference right] lease. . . . An EIS which discusses those lease terms is therefore required.

Brief for the Federal Appellees, supra, at 32-33.

---

you know, Interior's 1979 regulations governing PRLAs contained an extensive list of required contents for EISs and EAs. 43 C.F.R. § 3430.3-2 (1979). The new 1982 regulations delete these requirements entirely. 47 Fed. Reg. 33143 (1982) (to be codified at 43 C.F.R. § 3420.3-2). Objections to this deletion were answered last year with the promise that "specific instructions" would be forthcoming in "internal memoranda and manuals." 47 Fed. Reg. at 33126.

None has been issued. BLM's latest "commitment" to publish instructions, "during the summer of this year [1983]," comes too late. Letter from Director Robert F. Burford to Johanna H. Wald and Laura B. King, Natural Resources Defense Council, Inc., at 4 (April 5, 1983). The local BLM offices have completed, on their own and inconsistently, EAs and EISs without any uniform "instructions." Now, we suspect, no uniform instructions will be published, for fear of upsetting Interior's self-imposed goal of completing all PRLA reviews and lease issuances by December 1, 1984.

It is also evident as a practical matter that issuance of preference right leases (for mining projects typically covering from 5,000 to 25,000 acres, in many cases to be strip mined) will cause major impacts on wilderness, soils, water supply and quality, air, wildlife, cultural resources, and the local economy. Even as superficial as they are, these EAs amply demonstrate that the impacts will be significant.

As stated in our February 8 letter, the EAs are deficient because of omitted or inadequate analysis of:

1. Environmental impacts,
2. Measures to mitigate those impacts,
3. Lease terms to translate those mitigation measures into action,
4. Costs of compliance with mitigation measures,
5. Alternatives to lease issuance, and
6. Opportunity for public comment.

These serious deficiencies - documented in detail below - prevent the BLM from properly making the "commercial quantities" determination specifically required by the Mineral Leasing Act, 30 U.S.C. § 201(b) (1976).

The BLM's April 5 response to our February 8 letter does not respond to or rebut these deficiencies. It suggests that

> \- a halt until program deficiencies are remedied is not "warranted," because of the Department's self-imposed completion date of December 1, 1984;
>
> \- "whether or not EAs or EISs or both are prepared for all PRLAs," BLM has "fully compl[ied] with NEPA";
>
> \- alternatives to lease issuance such as exchanges, cancellations, and withdrawals are "speculation" or "fruitless";
>
> \- incomplete analysis of mitigating measures, costs, lease terms, etc., is a function of the "sequence of procedures" BLM has adopted for processing PRLAs.

That these points are not responsive to Judge Green's Order can be seen from the following (non-exhaustive) examples of the six deficiencies listed above:

1. Analysis of Environmental Impacts

The District Court opinion states:

> The EIS should not . . . be so limited that . . . it does not assess the overall environmental impact of the issuance of the leases. . . .

458 F. Supp. at 938. None of the PRLA environmental documents adequately does this. Discussion of three impact areas - reclamation, water resources, and wilderness values - gives a sufficient indication of these analytic deficiencies.

a. Reclamation. In areas to be strip mined, reclamation potential is obviously a critical concern. The analysis of reclaimability is needed not only to assess environmental consequences but to assist BLM in developing lease terms that will prevent unreclaimable areas from being developed and ensure reclamation of areas where it is feasible. Judge Green's opinion expressly states:

> NEPA requires the Secretary to determine particularized lease terms for land reclamation.

438 F. Supp. at 936. Not one of the environmental documents we have reviewed complies with this clear judicial directive. Many of them do not assess reclamation potential at all. See, e.g., the following Wyoming EAs: Stevens North, WY-062-2-27; Stevens South, WY-062-2-26; Sand Draw, WY-062-2-25; South Powder River, WY-062-2-28; Thunderbird, WY-061-1-48; Thunderbird II, WY-061-1-49; Wildcat Creek, WY-061-1-52; South Gillette, WY-061-1-47; Belle Fourche, WY-061-1-51; Ulm, WY-061-1-50. In every other case, the documents simply assure that reclamation will occur. the following quote illustrates the typical level of analysis:

> The soils, while rated poor, can be reclaimed but would require more intensive and costly management to be revegetated and stabilized.

Woodson EA, MT-020-48-2-46, at 28. Only one of the EAs even acknowledges the well-documented difficulties of reclamation in the West, let alone the extensive literature on the subject. See Beans Spring/Table/Black Butte Creek EA, WY-049-EA82-37, at 43.

b. Water resources. Most of the environmental documents are equally uninformative as to the impacts of mining on ground and surface water. For a blatant example:

> Mining impacts caused by each project would be similar to what other mines have created in Wyoming. The possible exception is their location in an aquifer recharge system (i.e., the Rock Springs Uplift). Although insufficient data exist to accurately determine the scope of impacts, groundwater outside the mine boundaries could be affected.

Beans Spring at 42. Others are similarly cursory in treatment of this vital resource.

c. Impacts on wilderness values. Approximately 54,000 acres under 15 PRLAs lie in Wilderness Study Areas (WSAs) or areas currently under Departmental appeal for failure to be designated as such. Several of the EAs in these cases state or imply that there will be no diminution of the areas' wilderness values because their development will be conditioned by stipulation:

> There would be no impact to wilderness because any SUNOCO coal lease issued for lands under wilderness review must carry a wilderness protection stipulation (Appendix A, Interim Management Policy and Guidelines for Lands Under Wilderness Review) that would prevent any impairment of the land's suitability for preservation as wilderness.

Sunoco/North Kaiparowits, UT-040-82-23, at 22. This conclusory approach fails to examine the effect of the stipulation on the "commercial quantities" decision and fails to assess the impacts which may result from the "temporary" activities allowed under the stipulation.

Several of the EAs do not even acknowledge that the wilderness protection stipulation must be applied to PRLAs located in WSAs, thereby contradicting those EAs that do. Moreover, these inconsistent EAs dismiss the whole issue on the ground that "PRLAs possess rights which are not subject to the non-impairment standards." Meadowlark Farms/Henry Mountains EA, U-6733, U-6740, U-9238. This position is flatly contrary to Section 603(c) of the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. § 1782(c), the governing Solicitor's Opinion, 86 I.D. 89 (1978), and Rocky Mountain Oil and Gas Ass'n v. Watt, 696 F.2d 734 (10th Cir. 1982). Finally, the EAs on areas which have wilderness characteristics, but are not designated WSAs, contain no meaningful analysis of the impacts of coal development on those natural values.

2. Mitigation Measures

The District Court opinion contains extensive guidance on the need to develop in the EIS methods for mitigating environmental harms. 458 F. Supp. at 936-39. All of the EAs and EISs take this guidance lightly. Many do not discuss mitigation measures at all, even for identified environmental impacts. E.g., Meadlowlark Farms/Henry Mountains (socioeconomic); all of the Casper District, Wyo., EAs (water resources, socioeconomic). Where mitigation proposals are mentioned, in most instances they consist of no more than vague promises of "compliance with applicable laws" (e.g., Sand Butte; Meadowlark Farms/Elbert County, C-8257 to C-8261; Meadowlark Farms/Arapahoe County, C-8253, C-8264; Mand/Adams County, C-8265) or a proposal for a "study" (Meadowlark Farm/Henry Mountains; Sunoco/North Kaiparowits; all Casper District, Wyo., EAs; Sand Butte; Savery Final EIS).

None of the documents analyzes the effectiveness of the proposed mitigation measures nor alternative mechanisms to provide the needed mitigation. Thus, they provide absolutely no basis for agency decision on mitigation measures, lease terms, costs, or commercial quantities. This is a blatant violation of the Secretary's statutory obligation of "safeguarding . . . the public welfare" (MLA, 30 U.S.C. § 187) "to the fullest extent possible" (NEPA, 42 U.S.C. § 4332), as stated by the District Court. 458 F. Supp. at 936 n. 17; compare, Pring, Power to Spare: Conditioning Federal Resource Leases to Protect Social, Economic, and Environmental Values, 14 A.B.A. NAT. RES. LAW. 306 (1981). These inadequacies can be illustrated by four areas:

a. Socioeconomic impacts. The environmental documents indicate

that, in many cases, development of the PRLAs will add significantly to already severe socioeconomic problems. "Socioeconomic and cultural costs of rapid industrialization and urbanization" were a particular concern of the District Court. 458 F. Supp. 936-37. Yet, none of the PRLA documents recommends what measures should be taken by the applicant to mitigate further socioeconomic impacts. One draft EIS conceded "significant impacts," but baldly stated BLM has "no authority" to control them. Savery Draft EIS at 15. In response to intense criticism, the final EIS switched to "little authority." Savery Final EIS at 19. Several other EAs indicate the need for such mitigation measures, but simply direct the applicant to conduct a "study," after the lease is issued, to determine what measures are needed. Savery Final EIS at 35; Beans Spring at 61.

This approach is a flagrant violation of Berklund.

b. Cultural and paleontological resources. The environmental documents indicate that many of the PRLAs contain significant cultural and/or paleontological resources. Unless protective measures are taken, historic and prehistoric relics and fossils will be destroyed by surface mining and threatened even by underground mining. Rather than specifying what mitigation measures must be taken to prevent the destruction of these resources, all of the EAs simply recommend that the applicant be required to conduct an "inventory" of the resources. For example:

> Before undertaking any activities that may disturb the surface of the leased lands, the lessee must have an archaeologist conduct an intensive field inventory for cultural resources on any areas that could be adversely affected by lease-related activities.

Stevens North at 14.

This approach plainly contravenes the Berklund decision. The BLM must know, before it makes any "commercial quantities" determination, the extent to which such resources exist and their location and must have developed specific proposals for their protection. None of the environmental documents performs this function.

c. Reclamation. As discussed above, none of the environmental documents adequately assesses the reclaimability of the PRLA areas. This lack has resulted in a failure by all the environmental documents to develop meaningful mitigation recommendations to ensure reclamation of the mined lands. At best, some documents specify the allowable steepness of spoil grading and recommend seed mixture guidelines. See, e.g., Beans Spring. In other cases, the EAs simply do not recommend mitigation measures at all. See, e.g., Meadowlark Farms/Arapahoe County.

d. Wilderness impacts. In those projects where PRLA development on the periphery of Wilderness Study Areas will be detrimental to the wilderness values of those areas, the environmental assessments fail to propose mitigation measures to prevent such impairment. For example, a typical EA admits that

> The conveyor, powerline and service road would have significant

> on-the-ground impacts to both the Mt. Ellen/Blue Hills WSA's naturalness and the opportunities for solitude. As proposed, these facilities would follow the Sweetwater drainage and would cross approximately nine miles of the WSA. It would be difficult for a wilderness user to either visually or audibly ignore these evidences of man's presence.

Meadowlark Farms/Henry Mountains at unnumbered page ___, in Chapter 3, Section L.2. Then the EA does not even attempt to propose or analyze mitigation measures, stating:

> Any mitigation measures undertaken would be unlikely to reduce or alleviate impacts sufficiently to preserve and maintain wilderness values throughout the term of operations.

Id. It should be obvious that, without the required analysis of mitigation proposals, such a "decision" cannot be made. The BLM cannot issue preference right leases affecting WSAs until it has developed conditions that will "insure that the Secretary would preserve the wilderness character of the[se] lands." Rocky Mountain Oil and Gas Ass'n v. Watt, 696 F.2d 734, 747 (10th Cir. 1982).

3. Lease Terms

The District Court's decision in Berklund makes it unequivocally clear that

> NEPA requires the Secretary to determine particularized lease terms for land reclamation and air, water and wildlife protection. . . . NEPA . . . does direct him to exercise his authority to safeguard society and prevent irreparable damage to the environment through careful and complete formulation of lease terms.

458 F. Supp. at 936-37 (emphasis added). These may be

> either general performance lease standards which require mitigation, if not elimination of social, aesthetic and land resource costs to society . . . or more stringent lease requirements which will prescribe the detailed methods for mitigation of exceptional and special environmental harms.

458 F. Supp. at 937. Most of the environmental documents completely lack any such lease terms.

Moreover, the lease terms that are included in the EAs or accompanying decision documents do not approach the "particularized" level required by the Court. Id. Not surprisingly, the inadequacies of the mitigation measures, discussed above, are mirrored in lease terms. These include excessive reliance on existing law and regulations and upon applicant "studies" of the problem, after the leases issue. See, e.g., all Casper District EAs; Woodson (Mont.) EA; San Juan River Regional EIS. In other cases, the mitigation measures recommended in the EA were simply not carried forward into lease stipulations. See, e.g., Meadowlark

Farms/Prairie-Custer Counties, MT-020-48-2-47 (surface water mitigation measures, at 26, not included in lease stipulations). The BLM is required by law to develop detailed, site-specific lease terms, based on mitigation measures that have been analyzed as to their effectiveness, prior to issuance of any preference right lease. The importance of this step cannot be overstated; as Judge Green observed:

> [B]ecause the cost of compliance with these lease terms will decide whether the permittee meets the commercial quantities requirement, it is the setting of the lease conditions which is crucial to the determination of whether or not the lease will issue.

458 F. Supp. at 936.

4. Costs of Mitigation Measures

The Berklund decision clearly requires the BLM to analyze and include the costs of recommended mitigation measures in the EIS:

> [T]he Secretary . . . should have before him a comprehensive EIS which includes a careful examination of possible performance lease standards, alternative methods for meeting those standards, and estimated costs of compliance.

458 F. Supp. at 938 (emphasis added). None of the environmental documents recommends mitigation measures in enough detail to allow the reader to estimate their costs, and not one presents the BLM's estimate of their costs.

This is a crucial omission, because, as Judge Green's opinion points out, the costs of mitigation "will decide whether the permittee meets the commercial quantities requirement" (458 F. Supp. at 936) and could mean a permittee "will be unable to make the requisite stautory showing and will not receive the lease." 458 F. Supp. at 937.

BLM's recent letter admits that it has adopted a "sequence of procedures" that turns the Berklund decision on its head, whereby

> Applicant's submission of information on costs of compliance, and BLM's evaluation of it, do not occur until after the environmental analyses are complete.

At 3. The agency's procedures clearly must be changed to comply with the Court's Order.

5. Alternatives

The District Court requires the BLM to consider two levels of alternatives in the EIS: (1) "alternative methods for meeting [performance lease] standards" and (2) "alternative courses of action" instead of lease issuance. 458 F. Supp. at 938. Both are lacking in the environmental documents reviewed.

The omission or inadequacy of lease term analysis, including alternatives, has been addressed above. The EAs are equally frivolous in addressing alternatives to lease issuance. A typical discussion admits that exchange or purchase is possible, but then comments:

> Either the exchange of sensitive areas or the purchase of Western Fuels' interests in a given PRLA area could result in the exclusion of mining in all or part of the Stevens North Unit.

Stevens North at 4. This conclusory statement, with no factual support, is no substitute for the detailed analysis of this issue spelled out in Berklund. 458 F. Supp. at 938.

6. Public Notice

In most cases, the BLM has made only a minimal effort to inform the public that the EAs have been prepared. Most of the documents were noticed only in local newspaper announcements, with no attempt made to actually notify local groups with a known interest in the subject or the plaintiffs in the Berklund case. Indeed, in one instance, when local people discovered that draft EAs had been prepared, their request to see those documents was denied until after the final EAs were issued. Letter from BLM Casper District Manager to Powder River Basin Resource Council (July 23, 1982).

The lack of public involvement in the preparation of the environmental assessments of the PRLAs has undoubtedly contributed to their failure to conform to the requirements of NEPA and the Berklund decision.

Conclusion

These organizations and others have a longstanding, demonstrated commitment to the National Environmental Policy Act and its application to the preference right coal leasing program. We would be happy to meet with your representatives, if that would produce constructive efforts to bring the program into compliance. Absent that, the seriousness of the current noncompliance and the reported imminence of lease issuance will leave us no choice but to initiate appropriate enforcement proceedings before the U.S. District Court.

Sincerely yours,

George W. Pring
Attorney at Law

GWP/cld

EXPRESS MAIL
RETURN RECEIPT

FILED
JUN 30 1978
JAMES F. DAVEY, Clerk

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

NATURAL RESOURCES DEFENSE COUNCIL, INC., et al :
Plaintiffs :
v. : Civil Action No. 75-0313
CURTIS J. BERKLUND, et al :
Defendants :
and :
UTAH POWER & LIGHT COMPANY, et al :
Intervening Defendants :

ORDER

Upon consideration of the cross-motions for summary judgment, the transcript of oral argument before the Honorable Judge Louis F. Oberdorfer, the entire record herein, and for the reasons set forth in the accompanying Opinion, it is by the Court this 30th day of June 1978,

ORDERED that defendants' and intervenors' motions for summary judgment are hereby granted insofar as the Court finds that the Secretary of the Interior does not have discretion to reject preference right coal leases under 30 U.S.C. § 201(b) where coal has been found in commercial quantities; and it is further

ORDERED that in all other respects, defendants' and intervenors' motions are hereby denied; and it is further

ORDERED that plaintiffs' motion for summary judgment is hereby granted insofar as the Court finds that where the issuance of a preference right coal lease would constitute a major federal action significantly affecting the environment, the Secretary is enjoined from issuing said lease unless he first prepares an appropriate Environmental Impact Statement (EIS); and it is further

ORDERED that in all other respects plaintiffs' motion is hereby denied; and it is further

ORDERED that this case is dismissed

JOHN L. SMITH
U.S. District Judge

Monitoring response of elk to a natural gas field in Western Wyoming

DRAFT DRAFT DRAFT 1979-1987 DRAFT DRAFT

Bruce Johnson and Lee Wollrab
WY Game & Fish Department

Exxon Company, U.S.A. has completed Phase I development of gas reserves in the Riley Ridge Project area encompassing the southern portion of the Piney Elk Herd and Hunt area 94. This 48,000 acre well field, known as the LaBarge Project, is on elk summer, winter, crucial winter, and calving ranges (Figure 1). Monitoring programs were initially established in 1979 to assess effects of well drilling on a calving area in Snider Basin. During 1979 and 1980, about 100 hours were flown each year to document elk distribution throughout the Piney Elk Herd and elk response to drilling operations(Johnson B.K. and D. Lockman. 1980. Response of elk during calving to oil gas drilling activity in Snider Basin, Wyoming. in District I Annual Big Game Herd Unit Reports, Piney Elk Herd. 14pp.) Field development began in 1984, and the monitoring program expanded to include intensive observation of elk distribution on the Rock Creek, Graphite Hollow and Riley Ridge winter ranges and the Lake Ridge and Snider Basin calving area.

This final report summarizes results from 1979 through 1987 concerning elk distribution and use of the Rock Creek - Graphite Hollow winter range, Riley Ridge winter range, Lake Ridge calving area and Snider Basin calving area. Changes in distribution and declines in elk numbers associated with winter ranges and calving areas are documented and discussed.

AREAS MONITORED

Graphite Hollow/Rock Creek Winter Range.

The Graphite Hollow and Rock Creek winter range is on the south end of Deadline Ridge. Up to 400 elk have been observed on this winter range during aerial trend counts since 1968.

The Graphite Hollow-Rock Creek winter range consists of two drainages. Graphite Hollow contains about 16,000 acres of crucial winter range consisting of a series of wind-swept, snow-free ridges. Vegetation is dominated by sagebrush (*Artemesia spp.*) or grass (*Festuca spp.*) stands with a few isolated aspen (*Populus tremuloides*) stands. Conifer cover is limited to the head of Graphite Hollow and the Hogsback Ridge. Rock Creek contains about 8,000 acres of crucial winter range. Wind-blown, snow-free slopes provide foraging areas, and mixed conifer and aspen stands provide cover. Elevation is from 7,200 to 9,600 feet above sea level for both drainages. Well 2-15, drilled and completed in 1984 - December 1985 was at the head of Graphite Hollow on crucial elk winter range (NW1/4 NE1/4, Sec. 21, T27N, R114W). The drill pad was located in an aspen-lodgepole stand, and was separated from the nearest windswept slope by about 30 feet by small aspen trees. The drilling rig was visible from all areas in Graphite Hollow and noise associated with the drilling activity was audible throughout this winter range.

In March 1984, Exxon proposed to drill well 2-15 (Graphite Hollow well) in 1986. Sixteen radio-collars were to be placed on elk for obtaining distribution information in 1984-85 for comparison to distribution data of these elk during drilling activity in 1985-86. Exxon accelerated its drilling schedule, however, and drilling started in October 1984. Thus, there was no opportunity to trap and radio-collar elk prior to drilling and the monitoring program was revised.

Elk distribution on this winter range was determined by aerial and ground reconnaissance from winters 1979-1983, November 1, 1984 through May 19, 1985, November 1, 1985 through May 16, 1986 and December 12, 1986 through May 6, 1987. These years provided information on elk distribution during predrilling (winters 1979-1983), drilling (winter 1984-85), completion and workover rigs November-December 1985, no activity January-May 1986, and production (winter 1986-87).

Drilling was initiated in October 1984, and the well was completed in December 1985. Gas flow testing on Graphite 2-15 was completed December 19, 1986 and occasional human activity continued at the well site until the end of January 1986 when the road was no longer plowed. Work to reopen the road was initiated in April 1986, and this well was placed into production in August 1986. Human activities associated with well service and maintenance continues at least twice per week and may occur as often as daily if needed.

Observations of elk distribution during winters of 1984-1986 were compared to distribution obtained during aerial reconnaissance from 1979-1984 of elk on this winter range. Location of observations were plotted on maps. Distance of elk sightings from well 2-15 and number of sightings within Rock Creek *vs.* Graphite Hollow were determined for predrilling, drilling, and production periods. In an attempt to document movements within the Graphite and Rock Creek winter ranges and fidelity to the winter range between years, trapping was conducted in winter 1985-1986. Clover traps were placed on Rock Creek in fall and trapping was initiated in January 1986. Efforts were made to minimize distrubance to the trapsites. Radio transmitters were affixed to the traps and emitted a signal only when the trap was closed, indicating an elk was in the trap. Traps were set for 3-5 days and then closed for 5-7 days to allow elk undisturbed access to this winter range. Trapping was not conducted in Graphite Hollow to avoid harassing elk away from the drill site during trapping activities. Seven elk were trapped on Rock Creek during 22 nights of trapping (88 trap nights), and radios were attached to four of these animals (Table 1). Summer distribution, movement on this winter range, and fidelity to the winter range was determined by locating radios from aircraft.

Lake Ridge Calving Area.

Elk distribution was determined by aerial reconnaissance in 1984, 1985, 1986 and 1987 and compared to distribution of elk obtained in 1979-1983. The Lake Ridge calving area consists of east-west ridges bisected by steep-sided drainages. North aspects support conifer stands and south aspects support grass and sagebrush stands. East aspects and flat areas contain aspen or wet meadow stands. This calving area contains a mosaic of aspen, conifer, wet meadow, grass and forb, and sagebrush stands.

Snider Basin Calving Area.

Elk distribution and habitat use were determined in 1979 and 1980 in a study of elk response to a well drilled by Exxon in the Snider Basin calving area (Johnson, B.K. and D. Lockman. 1980. Response of elk during calving to oil/gas drilling activity in Snider Basin. in District 1 Annual Big Game Herd Unit Completion Reports, Piney Elk Herd. 14 pp.). This well was completed in 1979. Aerial reconnaissance and pellet transects were used to estimate elk use in Snider Basin during calving in 1984, 1985 and 1986. These data were compared to data collected in 1979 and 1980. From 1980 to 1983, there was little activity in Snider Basin during the calving period. In 1983, however, Exxon began drilling well 2-28 on Packsaddle Ridge, and a

second well 3-15, was started in spring, 1984, in the Basin (Figure 2). Six pellet transects consisting of 10 circular 0.01 acre plots, were located in Snider Basin.

Riley Ridge Winter Range

Crucial winter range occurs on Riley, Reed, and Trail Ridges. Elk distribution on those ridges has been determined from 1977 and 1980-1987 using aerial reconnaissance. American Quasar Corporation drilled one well in 1980, and three wells in 1981 on Riley Ridge. Distribution and movements of elk were compared for predrilling, drilling, and postdrilling. During pre and postdrilling, no human activity occurred on Riley Ridge in winter, as access was controlled by private landowners and as roads were plowed. Exxon Company, U.S.A. owns leases only on Trail Ridge as of December 1986.

RESULTS

Graphite Hollow/Rock Creek.

Distribution of elk was different during the drilling and production periods compared to the predrilling period and the number of elk using this winter range has declined since drilling was initiated. From November 1 - May 19, 1979-84, elk were observed on 76 occasions totalling 1,377 elk in the Graphite Hollow/Rock Creek winter range. During October 31, 1984 through May 19, 1985, 1,484 elk were observed on 47 occasions. In the predrilling period, 76% of the groups of elk sighted and 80% of the animals counted were in Graphite Hollow. In 1984-85, only 32% of the groups of elk and 39% of the total elk observed were in Graphite Hollow (Table 2). In the completion period, November-December 1985, 20% of the groups of elk and 11% of the total elk were observed in Graphite Hollow and in 1986-87 67.0% of the groups of elk and 24.0% of the total elk observed were in Graphite Hollow (Table 2). During January-April 1986 when there was little or no activity at the well site and the road was not plowed, 32% of the groups of elk and 62% of the total elk observed were in Graphite Hollow. Small groups of elk

were scattered in Rock Creek whereas a few large groups of elk were seen in Graphite Hollow (Table 3). This indicates that elk selected for habitat in Graphite Hollow when there was no activity at the wellsite

Elk use of the head of Graphite Hollow and areas adjacent to the drilling rig (Sec. 21) was less in November 1986-May 1987 compared to November 1979-May 1984. From 1979-84, some elk were observed in Section 21 on 47% of of the days elk distribution in Rock Creek or Graphite Hollow were recorded into the Wildlife Observation System (Table 4). During well drilling in 1984-85, elk were observed using Section 21 on only 11% of the aerial and ground reconnaissance. In December 1985-January 1986, when completion work was ongoing, on 3 flights, only 1 group of 26 elk was observed in Section 21. After the road was closed, elk were observed in Section 21 on 2of5 flights, totaling 77 elk. Elk distribution during the lull in wellfield activity was beginning to resemble elk distribution prior to field development.

In 1985-86, 12% of the elk observed and 25% of the observations were in Section 21, adjacent to well 2-15. In 1986-87, 24% of the elk observed and 6% of the observations were in Section 21.

In 1984-85, no elk were observed within 1/2 mile of the well and were observed on only 4% of the sightings between 1/2 and 1 mile of the rig. During 1979-84, 14% of the groups of elk sighted were within 1/2 mile, and 13% of the groups of elk sighted were between 1/2 and 1 mile of the well site (Table 5). Observations of elk in Sections 22 and 27 show similar declines in use during drilling activity compared to non-drilling activity (Table 6, Figures 3 and 4). On 28% of the flights, elk were observed in Sections 21, 22, or 27 in 1984-85. In 1979-84, elk were observed on 67% of the flights in these sections. Percent occasions that elk were observed within 2 1/2 miles of the well site in Graphite Hollow declined 59% during the drilling period; within 1 mile of the well, percentage declined 86% compared with pre-drilling distribution.

Elk distribution in winter 1985-86 was similar to that observed in winter 1984-85 when the well was being drilled. Elk were observed on 39 occasions in 1985-86 and on 73% of these occasions, elk were in the Rock Creek drainage. In 1984-85, elk were observed using Rock Creek on 68% of the occasions elk were observed. This distribution is opposite of the elk distribution observed from 1979-1984 when 68% of the time elk were observed in Graphite Hollow. In 1984-85, no elk were observed within 1/2 mile of the well location. In 1985-86, observations of elk near the well site were made after daily activity had ended on 19 December when the well was completed (Table 2). Elk were observed within 1/2 mile of the well site on January 4 (26 elk), April 17 (75 elk) and May 1 (2 elk), 1986 (Table 3).

During the 1986-87 winter, elk have been observed using Graphite Hollow on only 2 occasions (March 21 [23 elk] and April 15 [29 elk]) even though Exxon had limited their activity at the well sites to trips made daily in over-snow vehicles (i.e. Thiokol, Muskeg) between 10:00 am and 3:00 pm. Usually, only one trip was made for well service and trips were not always made every day.

Elk use of Rock Creek increased during drilling activity. The Rock Creek drainage is seperated by a dense stand of lodgepole ??? pine between the east ridge along the creek and the west edge of well 2-15. In 1984-85, 68% of all elk groups observed were in Rock Creek during drilling activity, an increase of 113% from their predrilling distribution. Elk were separated from drilling activity by 1 mile of conifer cover and were located below a ridgeline. Most of the elk sightings were made in Section 17. In 1985-86, 73% of the observations of elk were in the Rock Creek drainage. In 1986-87, the most elk observed in Graphite Hollow was 29 and on Rock Creek was 168. These were on different days and elk were not observed on the same day using both areas.

*Based on observations made during the 1986-87 winter, the elk have not habituated to the limited activity and have, to this point, abandoned the Graphite Hollow portion (16,000 acres) of the crucial winter range. Even as snow began to accumulate in January and February, elk did not move from Rock Creek into Graphite Hollow and appear to be avoiding the human activity associated with well 2-15.

* Future monitoring efforts will include analyzing forage utilization on the Rock Creek range to anticipate overgrazing and the effects this could have on the Piney elk herd.

Trend Counts and Movements of Radio Collared Elk

Four elk were radio collared in January-April 1986 (Table 1) and movements between the Rock Creek and Graphite winter ranges were documented. A female calf trapped on January 24, 1986 on Rock Creek was relocated on the east side of Graphite Hollow with 97 other elk on March 4, 1986. She moved back to Rock Creek later in March where the collar slipped off her. One cow elk collared on Rock Creek died that spring. While collared, she moved along

Rock Creek. This elk was found dead about 200 yards from the bottom of Rock Creek drainage. There were puncture wounds at the base of her skull indicating she died from mountain lion predation.

The 2 remaining elk moved off this winter range onto Packsaddle Ridge, and were west of Snider Basin in June. They summered on the east side of Mount Coffin in the Wyoming Range (T30N, R116W, Sec.2). Neither of these elk returned to the Rock Creek-Graphite Hollow winter range.

The cow with radio collar 172.520 moved to the south end of Porcupine Ridge along Hobble Creek (T29N, R118W, Sec. 36) in Hunt Area 104. This elk was with 33 other elk on December 12, 1986. Radio 172.550 wintered on Big Fall Creek on the northwest side of Deadline Ridge (T28N, R118W, Sec. 29) with her calf (Hunt Area 94). This is not normally used winter range. This elk would have likely died if snow pack would have been normal in 1986-1987. These animals may have responded to the trapping activities and abandoned the winter range. However, the trend counts do not support this hypothesis. The trend count of 168 is the second lowest on

record for this winter range, and the trend count has declined for the last 3 years. This decline can be correlated with field development. Whether the decline is due to range abandonment, due to a response to the activity and or to increased harvest because of increased access throughout the well field cannot be determined categorically and no increase in harvest was noted within this well field during field checks. On the contrary, many hunters lamented of not being able to find elk to hunt.

In 1985-86 the elk trend count in hunt area 102, directly south of Rock Creek and Graphite Hollow was about 200 more than expected. At the same time, the January 1986 trend count for Rock Creek-Graphite Hollow was 54 lower than the mean of the last 4 years. It is highly probable that some of this increase in hunt area 102 is from elk abandoning the Rock Creek-Graphite Hollow winter range. Again in 1986-87 the Rock Creek-Graphite Hollow winter range trend count was down 70 elk from the previous 6 year average of 238 to 168 elk. Some of the elk from Rock Creek-Graphite Hollow wintered out of the herd on Hobble Creek.

Elk response to drilling activities are clear. Elk abandoned a portion of * the Graphite Hollow winter range. This is the best portion of the entire winter range based on predrilling elk distribution providing the best mix of forage, hiding cover and thermal cover. Forage production based on ocular estimates is much higher in Section 21 than 17, where elk were observed feeding from 1979-1985. In Section 21, a mix of grasses, forbs and shrubs are present. In Section 17, the forage is limited to mostly grasses exposed on wind-swept snow free slopes. Snow in the Graphite portion is less than on Rock Creek due to wind action and topography. Rock Creek is a deep drainage with steep side slopes while Graphite Hollow is rolling terrain with less steep slopes. Snow accumulation in the lower portion of Rock Creek is much greater than on Graphite Hollow. Given the amount of snow free slopes and the total acreage in Rock Creek and Graphite Hollow, there is much more forage available in Graphite Hollow. Only when elk descend onto the lower elevations of Rock Creek do they use forage similar to that on Graphite Hollow in Section 21. The Rock Creek drainage is steep with

slopes of 40% ?? common and is excellent mountain lion habitat. The radio collared elk killed in Rock Creek may have been forced into poorer habitat in search of adequate forage.

The winters between 1979 and 1986-87 ranged from extremely mild (1980-81) to severe (1983-84). The 1984-85 winter was mild but the 1985-86 winter was severe with major snow storms and extended cold temperature periods. The 1986-87 winter was mild. Throughout the predrilling years, elk were found throughout the Rock Creek and Graphite Hollow winter ranges. In the middle of winter when conditions were most severe, few elk were found in Rock Creek.

In winters 1984-85 and December 1985 and 1986-87, elk use of winter range at the head of Graphite Hollow was dissimilar to use observed in 1979-1984. From 1979-1984, there was no activity at the well site. In response to the activity at well 2-15 and a lack of total forage available on Rock Creek to support additional numbers of elk, some elk moved to different winter ranges. A significant portion of the winter range was not used during

1984-85, 1985-86 or 1986-87 winters in response to the human activity associated with well 2-15.

Following drilling in January 1986 and prior to production, elk returned to Section 21 in 1985-86. Elk distribution is dynamic and elk respond readily to harassment.✓ One blue-collared elk marked in February, 1984 at Finnegan Feedground, was observed on LaBarge Creek in December 1985. Another elk, trapped at Finnegan feedground as a calf, was retrapped 2 years later on Rock Creek indicating some movement of elk to LaBarge Creek from north of the Rock Creek winter range. Movements of the radio collared elk to different winter ranges document the dynamic nature of elk distribution and their mobility in response to disturbance. When winter ranges are abandoned, they may be lost as evidenced by Cretaceous Mountain and Hogsback Ridge. These 2 areas historically supported elk in winter and they do not continue to do so.✓ When elk do abandon a winter range and are counted in other herds, such as Hunt Areas 102 and 104, management plans are adjusted. For each herd, there is a population objective and hunting seasons are the prime methods for controlling elk numbers. Seasons are based, in part, on

trend counts. When trend counts are up unexpectedly, seasons are set to reduce the number of elk to "objective" levels by increasing license quotas and or extending season lengths. When elk leave a herd, as in the case of Rock Creek elk going to Areas 102 and 104, seasons in those areas were adjusted and harvest increased to return that herd to the population objective level. The result is not only is a winter range lost, but the total number of elk in western Wyoming is reduced. The elk did not find some other place to winter. They were killed by hunters or forced into suboptimal habitat and died of starvation or predation.

Riley Ridge Winter Range.

Winter access to the Riley Ridge, Reed Ridge, and Trail Ridge winter range has been limited, because landowners controlled access and roads were not plowed or maintained in winter. The exception to this situation occurred in winters of 1980-81 and 1981-82 when wells were drilled on Riley Ridge by American Quasar Corporation.

Prior to 1980, 60 to 80 elk usually wintered on Riley Ridge with some on ridges to the south. In the winter of 1980-81, American Quasar Corporation drilled one well on Riley Ridge throughout the winter. That winter, no elk were observed on Riley ridge, and 80 elk were counted on Reed Ridge. In the winter of 1981-82, American Quasar Corporation drilled three more wells on Riley Ridge, and only seven elk were observed on Riley Ridge, and no elk were counted on Reed or Trail Ridges during that winter. Thirty-four elk were observed on an isolated mesa north of the east end of Dry Piney Creek approximately 12 miles east of Riley Ridge. These elk may have come from Riley Ridge. Distribution of other elk from Riley Ridge was unknown. In the winters of 1982-83, 1983-84, 1984-85, 1985-86 and 1986-87, 62, 42, 74, 6 and 6 elk, respectively, were seen on Riley Ridge. No activity occurred on this winter range in those years (Table 7).

When one well was drilled on Riley Ridge, elk moved to Reed Ridge and abandoned the winter range on Riley Ridge. In 1981, when three wells were

drilled, there was sufficient activity to cause most of the elk to completely abandon over 6,000 acres of crucial winter range. The physical disturbance consisted of approximately six miles of roads and three well pads, or 62 acres. Using the multiplier of 5 as used in the Environmental Impact Statement for the Riley Ridge Project, about 310 acres were predicted as being unsuitable for elk. This multiplier is inaccurate in this situation, as 6,000 acres were abandoned by elk in 1981 and based on this data the multiplier should have been 97, not 5.

No elk were observed on Riley Ridge during helicopter or fixed wing surveys from December until March 4, 1986 when 6 elk were observed. Ten elk were found on Dry Piney that winter that may have normally wintered on Riley Ridge, and up to another 40 elk were in a rancher's haystack on Dry Piney. It cannot be determined conclusively why elk abandoned the Riley Ridge winter range. From May through October there was intense construction activity throughout the well field from Trail Ridge to Deadline Ridge as wells were drilled, pipelines assembled and buried, and powerlines erected. Reclamation work continued up through mid-October. This activity may have prevented traditional distribution and movements of elk on summer ranges. Severe winter snow storms in November may have prohibited elk from returning to winter ranges on Riley Ridge. It was probably a combination of construction activities disrupting elk distribution followed by deep snows in November prohibiting elk from getting to and utilizing their traditional winter ranges that caused elk to winter in Dry Piney Creek. On May 1, 1986, 44 elk were observed on Riley Ridge and 17 elk were on Reed Ridge.

No elk were observed on Riley Ridge during helicopter or fixed-wing surveys until 6 elk were observed on January 30, 1987. Between January 30 and April 15, 1987, 50 to 80 elk were observed on North Mountain, located approximately 1.5 miles north of Riley Ridge and north of South Piney Creek. The 6 elk seen on January 30 had made tracks from North Mountain to Riley Ridge and after that flight no elk were observed on Riley Ridge. The elk have been displaced to North Mountain from Riley Ridge this winter and have moved towards Coal Creek on the west side of North Mountain. These elk may

move into Snider Basin to calve, but do not appear to be returning via Riley Ridge and it is unknown at this time whether they will return to Snider Basin at all.

Lake Ridge Calving Area.

Up to 140 elk in a group have been observed on Lake Ridge during May through July prior to development of the LaBarge Project (Table 9). During May - July 1984, when construction, surveying, and drilling activity was occurring, 11 cows and 2 calf elk were observed on Lake, Narrow, and Trail Ridges. On two other flights during this period, no elk were observed on Lake Ridge. On May 19, 1985, twenty-eight elk were observed on Lake Ridge. There was no drilling activity on Lake Ridge in May, 1985.

Elk use of the Lake Ridge calving area was not as great as observed from 1979-1983 prior to field development. On June 14, 1985, 43 elk were counted on Lake Ridge, about one-third the maximum number of elk counted in this area from 1979 - 1983. In 1984, only 28 elk were counted on Lake Ridge

during calving season. This decline in elk numbers can be directly correlated to drilling activity on Lake Ridge, and high counts were made during the time when no drilling occurred. The lowest count occurred during the time wells were being drilled on this calving area. In 1985, no wells were drilled, and efforts were made to minimize human activities on this calving area. There were various types of construction activities, including drilling and pipeline trenching and assembly occurring on the perimeter of this calving area. Most major construction was completed last year, and a road management plan has been devised to avoid human activity on this calving area during calving season. How elk respond to decreased activity still remains to be determined, but only 3 elk were observed on this calving area in May, 1986 and on May 28, 1987, 30 elk were observed using this calving area. It appears that the road closure has been effective since some elk have returned to this area to calve. However, it is obvious that these recent counts remain lower than the previous high counts made prior to drilling activity from 1979-1983 and may be a result of public use in the area, which was not restricted.

Snider Basin Calving area.

Drilling Period. Distribution of elk within Snider Basin during May - July, 1984, was monitored by aerial reconnaissance while tracking 21 radio-collared elk from Finnegan Feedground. These elk were part of a separate but related study. No elk were observed in Snider Basin until July 13, 1985, when 76 elk were observed. Five pellet transects consisting of ten 0.01-acre plots were searched for elk fecal pellets on July 13, 1984, and compared to pellet groups counted along the same transects in 1979 and 1980. In 1979, 1980, and 1984, 35, 30 and 5 pellet groups, respectively, were found along these transects. Combined with aerial reconnaissance information, these data indicate few elk, if any, calved in Snider Basin in 1984.

From February 1982 - March 1984, 116 elk were ear-tagged, including 21 which were radio-collared and 54 neck-banded on the Finnegan Feedground. In 1979 and 1980, elk movement into Snider Basin from Finnegan Feedground was documented. In fall, 1982, two ear-tagged elk were harvested in Snider

Basin or just south of the Basin. Since then, none of the radio-collared elk and no neck-banded elk have been observed or harvested in Snider Basin. Surveying, construction, and new drilling activity around Snider Basin in 1983 and 1984 delayed movement of elk into the Basin from the east and south. Road traffic into Snider Basin probably kept elk from moving into the Basin from the northeast.

Postdrilling. Elk calving activity in Snider Basin has increased since drilling activity has been completed. Drilling on locations Lake Ridge 2-27 and 15 in Snider Basin was completed before elk started calving in 1985, and there was no other construction activity on these sites until July. In 1984, drilling rigs were operating at both well sites, and no elk were observed in the basin until July 13. In 1985, however, elk were observed in the basin throughout the calving period, and the highest 1 day count was 13 elk.

Six pellet transects consisting of ten 0.01-acre plots were searched for pellet groups on July 10, 1986, and results were compared to number of pellet groups counted along the same transects in 1979, 1980, 1984, 1985 and 1986. Seven pellet groups were found in 1986, compared to 37, 30, 5 and 49 in 1979, 1980, 1984 and 1985, respectively. In 1985, 3 cattle scats were observed and in 1986, 40 cattle scats were observed on the transects and suspect cattle use in the area caused elk to redistribute within the basin and biased the comparative results for the 1986 data. Elk use of Snider Basin, based on pellet groups, was similar to that observed in 1979 and 1980, and elk responded positively to the existence of a disturbance-free area.

Other Critical Winter Ranges abandoned.

Pinegrove, Narrow, and Lake Ridges were crucial elk winter range in the early 1970s. Elk were scattered throughout all the south-facing and windswept ridges from Pinegrove to Riley Ridge (Pers. Comm. Chuck Thornton, Big Piney Game Warden). However, elk have not been observed in winter on the southern 3 ridges (i.e. Pinegrove, Narrow, or Lake) for the last 7 years. Gas field development has increased on Pinegrove and Narrow Ridges, with wells maintained throughout the year. This winter activity has been sufficient to cause elk to abandon this portion of their winter range.

Elk use of Cretaceous Mountain in winter has decreased also. Elk have been observed only 1 year out of 7 on this mountain. Oil and gas fields have been developed throughout this crucial winter range.

The Hogsback Ridge is on the east end of the Graphite Hollow winter range. Elk have been observed only 3 out of 7 years on this crucial winter range. Oil and gas wells are found throughout the Hogsback Ridge. Cretaceous Mountain and Hogsback Ridge would be excellent winter range without the human activity in the area in winter.

Miscellaneous Observations.

Arrests and cased involving poaching were up about 100 % compared to other years, and most of the incidents involved poaching mule deer on winter ranges. Hunters in the well field lamented about seeing much less game than in years past. Number of sightseers and traffic on the deer winter range was much higher than in past years, and about _____ times more deer were killed on U.S. Highway 189 and the Calpet Road than in other years.

DISCUSSION AND SUMMARY

Oil and gas exploration and field development in the Riley Ridge Project area have resulted in marked changes in elk distribution. On crucial winter range on Riley Ridge, a shift in distribution with one well was followed by abandonment of 6,000 acres of winter range when three wells were drilled. Elk have returned to this winter range since drilling ceased. Other historic crucial winter ranges (e.g. Pinegrove Ridge, Hogsback Ridge, Cretaceous Mountain) winter use has declined drastically, and is not expected to increase soon. Oil and/or gas fields are being maintained on these areas with no accommodation for elk behavioral and habitat needs in winter.

Drilling adjacent to Graphite Hollow winter range has led to a shift in distribution to Rock Creek, even with limitations on human activity. Whether elk will return to Graphite Hollow is unknown.

The number of elk counted was down, and their distribution different on the Rock Creek-Graphite Hollow winter range during field development and produdtion compared to pre-drilling numbers and distribution of elk. After the completion of testing Graphite 2-15 in December 1985, some elk used the head of Graphite Hollow. No elk were observed on the Riley Ridge winter range until March. Why these elk left is not known; however, it can be assumed to be related to the intense field construction that occurred in 1985.

Elk use of the Lake Ridge calving area was greater in 1985 when no drilling was occurring than in 1984 when wells were being drilled. The number of elk on this calving area was still less than half the number observed from 1979 - 1983. Number of elk observed calving in Snider Basin was higher in 1985 when there was no activity than in 1984 when 2 wells were drilled. Based on pellet-transects, elk use was about the same as that observed in 1979 and 1980.

The Graphite Hollow/Rock Creek winter range along with the Riley Ridge winter range supports the last two sizeable groups of elk remaining that winter on native forage in the Piney elk herd (i.e. they are not supported by feedgrounds).

Elk calving areas have also been affected. Elk temporarily abandoned the Lake Ridge calving area during drilling and associated activity in 1984 when intense drilling related activity was occurred throughout the area. Elk used the area again in 1985 when there was no activity in the Basin. Road traffic, construction, and drilling activity have also affected and apparently ended the usual movement of elk from Finnegan Feedground into Snider Basin. The changes discussed refer to only a small portion of the 48,000 acre well field to be developed. Only 14 wells were drilled by 1984 and 38 by 1987, which included constructing 3 manifold sites and a dehydration facility, with 64 wells planned in the field. Whereas elk have often been able to find suitable undisturbed habitats away from human activity to date, the cumulative effects of continued development of the LaBarge Project may lead to complete abandonment of historic ranges and a decline in the elk population.

To prevent this, commitments by Exxon Company, U.S.A. to road closures, placement of wells and roads outside crucial habitats, and habitat improvement projects will be necessary.

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Table 8. Number of elk observed on Lake Ridge 1980-86.

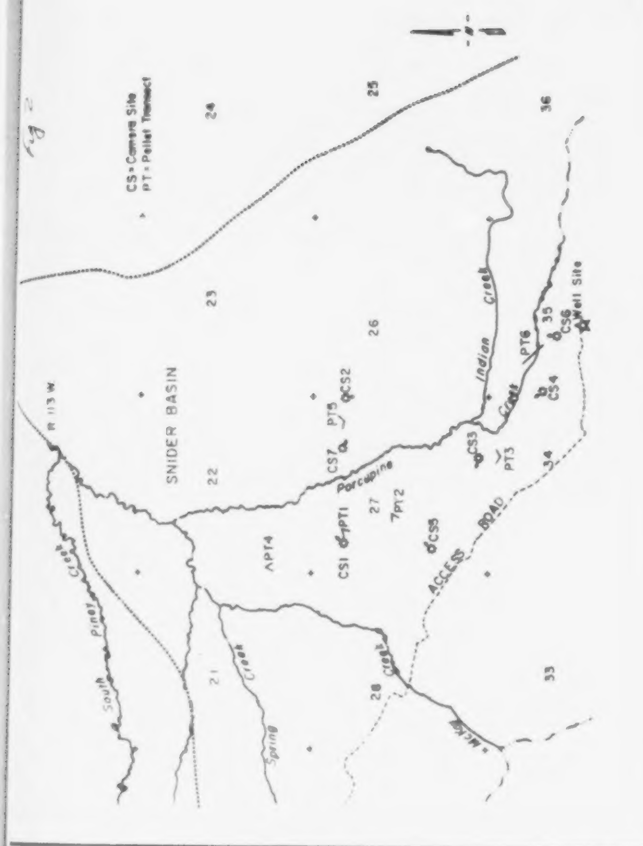

Table 1. Summary of elk trapped on Rock Creek in conjunction with Exxon monitoring program January 18 - April 5, 1986.

Tag Numbers	Sex	Age	Radio Frequency	Bled[a]	Date	Comments
G4438,G4439	F	A	172.460	Yes	1/19	Died later
G4440,G4441	M	C		Yes	1/20	
G2999,G3000	F	C	172.580	Yes	1/24	Collar fell off
G4442,G4443	M	C		Yes	1/26	
G4445,G4446	F	Yrlg.	172.550	Yes	1/27	
G2914,G2915	M	A		No	1/29	Recapture-tagged at Finnegan Feedground on 3/16/84
G4448,G4449	F	A	172.520	No	2/6	

[a]All tested negative for brucellosis.

Table 2. Number of elk observed on crucial winter range in Rock Creek and Graphite Hollow during aerial reconnaissance in 1979-1984 and aerial and ground reconnaissance in 1984-85, 1985-86 and 1986-87.

Period	Trend[a] Count	Rock Creek Groups	Rock Creek Total Elk	Graphite Hollow Groups	Graphite Hollow Total Elk
Pre-drilling (1979-84)	275	24 (32%)	274 (20%)	52 (76%)	1,066 (80%)
Drilling (1984-85)	198	32 (60%)	912 (61%)	15 (32%)	572 (39%)
Completion (Dec.1985)	203	3 (75%)	150 (86%)	1 (25%)	25 (14%)
No Activity (Jan-May 1986)	203	14 (64%)	355 (55%)	8 (36%)	293 (45%)
Production (1986-87)	168	1 (33%)	168 (76%)	2 (67%)	52 (24%)

[a]Trend count is the highest count used in management decisions.

Table 3. Date, location, and number of elk observed during monitoring of elk distribution from October 31, 1984 - May 6, 1987 in Rock Creek and Graphite Hollow in the Piney Elk Herd in conjunction with Exxon Company, U.S.A. LaBarge Project.

Date	Map Number on Figure 4	Location Section	Township	Range	Number Elk	Comments
10/31/84	1	SWNE 12	27	115	15	Ground
11/10/84	2	NENW 17	27	114	50	Ground
	3	SESE 24	27	114	14	
12/18/85	4	SESW 21	27	114	3	Ground
01/03/85	5	SWSE 17	27	114	47	Aerial
	6	NENE 24	27	115	1	
	7	34	27	114	7	
	8	34	27	114	37	
	9	NE 35	27	114	28	
	10	21	27	114	39	
	11	SWSW 21	27	114	1	
	12	11	27	114	5	
01/10/85	13	NENE 20	27	114	60	Aerial
	14	NWSE 20	27	114	35	
	15	SENW 29	27	114	7	
	16	SENE 24	27	115	5	
	17	SENE 26	27	114	24	
	18	SESE 26	27	114	72	
01/09/85	19	SWSE 22	27	114	50	Ground
	20	SWSE 17	27	114	35	Aerial
	21	NE 25	27	115	20	
	22	SWNW 22	27	114	25	
	23	NWSE 17	27	114	75	
	24	SWSW 17	27	114	40	
	25	SW 17	27	114	25	
02/28/85	26	NWNE 20	27	114	31	
03/04/85	27	SE 20	27	114	25	
	28	SWNE 28	27	114	24	
03/05/85	29	NWSE 27	27	114	47	
	30	NWNE 34	27	114	130	
03/20/85	31	SWNE 29	27	114	11	Aerial
	32	SWSE 20	27	114	4	
	33	SWSE 17	27	114	30	
	34	NESE 17	27	114	79	
04/05/85	35	NENE 1	27	115	30	
	36	SWSE 17	27	114	11	
04/06/85	37	SENE 17	27	114	20	
	38	SWNE 20	27	114	4	
	39	NWNE 17	27	114	50	
	40	NESW 8	27	114	25	
	41	NWSE 20	27	114	11	

Table 4. Sightings of elk by aerial and ground reconnaissance in Graphite Hollow, Rock Creek and on Lake Mountain from November 1 - May 19, 1979-84. Data were collected while conducting routine surveys, aerial trend counts and classification counts.

Date	Map Number on Figure 4	Section	Township	Range	Number Elk	
04/27/79	1	14	27	114	9	
	2	2	27	115	86	
	3	5	27	117	18	
	4	9	27	115	32	
	5	10	27	115	3	
	6	13	27	115	5	
02/12/80	7	21	27	114	5	
04/27/80	8	8	27	114	2	
	9	SE 8	27	114	1	
	10	8	27	114	24	
	11	8	27	114	26	
	12	E1/2,17	27	114	8	
	13	E1/2,17	27	114	8	
	14	21	27	114	14	
	15	28	27	114	35	
	16	NW 29	27	114	2	
	17	3	27	115	2	
	18	NW 3	27	115	20	
05/04/80	19	SW 16	27	114	6	
	20	SW 16	27	114	15	
	21	SW 16	27	114	11	
	22	SW 16	27	114	24	
	23	NE 21	27	114	2	
	24	SE 13	27	115	1	
	25	13	27	115	9	
05/19/80	26	NW 12	27	114	3	
	27	SE 12	27	114	5	
	28	NE 13	27	114	15	
	29	E1/2,14	27	114	0	
	30	NE 14	27	114	8	
	31	NE 17	27	114	3	
	32	NE 17	27	114	3	
	33	NW 24	27	114	4	
	34	NW 24	27	114	1	
	35	N1/2, 3	27	115	6	
	36	NE 4	27	115	1	
	37	5	27	115	1	
	38	3	27	115	8	
11/25/80	39	12	27	115	6	
	40	12	27	115	1	
03/01/81	41	SE 9	27	115	35	
	42	NESE 27	27	117	3	
	43	1	27	115	4	
	44	2	27	115	78	
	45	2	27	115	2	
	46	3	27	115	48	
	47	14	27	115	3	
05/15/81	48	3	27	115	2	
	49	3	27	115	3	
	50	9	27	115	3	
	51	20	27	115	6	
01/16/82	52	22	27	114	42	
	53	22	27	114	80	
	54	27	27	114	26	
	55	27	27	114	5	
	56	16	27	114	23	
	57	17	27	114	42	
	58	20	27	114	29	
	59	21	27	114	49	
	60	22	27	114	48	
	61	27	27	114	50	
	62	27	27	114	20	
	63	29	27	114	13	
11/03/82	64	29	27	115	20	
01/13/83	65	8	27	115	4	
	66	20	27	114	17	
	67	21	27	114	10	
	68	22	27	114	34	
	69	26	27	114	4	
	70	27	27	114	5	
	71	29	27	114	2	
	72	29	27	114	3	
	73	3	27	115	4	
	74	13	27	115	13	
	75	14	27	115	14	
	76	23	27	115	28	
	77	24	27	115	16	
04/15/83	78	20	27	114	2	
	79	26	27	114	39	
	80	27	27	114	56	
	81	29	27	114	3	
	82	34	27	114	5	
	83	35	27	114	17	
01/04/84	84	21	27	114	25	
01/05/84	85	12	28	114	3	
	86	NW 22	27	114	73	
	87	22	27	114	21	
	88	21	27	114	8	
	89	21	27	114	9	
	90	22	27	114	5	
	91	20	27	114	83	
	92	29	26	113	66	
04/04/84	93	27	27	115	7	
	94	27	27	114	40	
	42	SWSW 21	27	114	30	
04/24/85	43	SESW 17	27	114	30	
	44	NENW 20	27	114	3	
	45	SWSE 20	27	114	25	
	46	NESW 24	27	115	4	
	47	SENW 14	27	115	5	
	48	NW 14	27	115	9	
	49	NW 14	27	115	7	
05/19/85	50	SWSE 27	28	115	1	
	51	NWNW 8	27	114	6	
	52	NW 23	27	115	3	
	53	NWNW 17	27	114	5	
12/26/85	53	SENE 20	27	114	100	Rock Creek
	54	SWSE 17	27	114	42	Rock Creek
	55	NESW 12	27	115	8	Rock Creek
	56	36	27	114	25	Graphite-east
01/04/86	57	8	27	114	27	Rock Creek
	58	NE 20	27	114	59	Rock Creek
	59	NE 20	27	114	90	Rock Creek
	60	25	27	115	1	Lake Mountain
	61	SWNE 21	27	114	26	Graphite <0.5 mile from well site
01/29/86	62	NENW 22	27	114	3	Graphite >0.5 mile from well site
	63	NE 20	27	114	54	Rock Creek
	64	NE 25	27	115	7	Lake Mountain
	65	SWSE 24	27	115	25	Lake Mountain
	66	SWNE 20	27	114	15	Rock Creek
	67	23	27	115	1	Lake Mountain
03/04/86	68	NWSE 17	27	114	45	Rock Creek
	69	SWNE 26	27	114	98	Graphite-east
	70	NENW 17	27	114	2	Rock Creek
	71	NESE 17	27	114	15	Rock Creek
04/17/86	72	SESW 22	27	114	11	Graphite <1.0 mile from well site
	73	SENE 21	27	114	75	Graphite <0.5 mile from well site
	74	SESW 20	27	114	6	Rock Creek
	75	NENW 29	27	114	21	Rock Creek
	76	NE 13	27	115	1	Rock Creek
	77	SENE 13	27	115	3	Rock Creek
05/01/86	78	22	27	114	45	Graphite 1.0 mile east of well
	79	SWNE 21	27	114	2	Graphite 0.5 mile from well site
	80	NESW 22	27	114	33	Graphite 1 mile east of well site
	81	NENE 29	27	114	16	Rock Creek
	82	NESW 29	27	114	1	Rock Creek
05/01/86	83	NWNW 29	27	114	6	Rock Creek
	84	SWSW 20	27	114	10	Rock Creek
	85	NWNW 29	27	114	10	Rock Creek
	86	NESW 20	27	114	4	Rock Creek
	87	NESW 20	27	114	5	Rock Creek
05/16/86	88	NWNW 20	27	114	25	Rock Creek
	89	NWNW 20	27	114	1	Rock Creek
	90	NENW 20	27	114	1	Rock Creek
	91	NWNW 23	27	114	9	Graphite 1.5 miles east of well
	92	NENW 22	27	114	2	Graphite 1.0 mile SE of well
02/17/87	93	SESE 17	27	114	168	Rock Creek
03/21/87	94	SESE 21	27	114	23	Graphite <1.0 mile south of well
04/15/87	95	NENE 28	27	114	29	Graphite 1.0 mile south of well

Miscellaneous reports of elk on Graphite and Rock Creek Drainages:

03/05/85	96	NE 22	27	114	30-50	Drillers on rig saw elk about 0.5 mile east of rig. Elk in area from 2/15 - 2/28. Tracks seen on 2/15 - not seen on 2/28.
03/18/85	97	17	27	114	115	Lynn Jahnke
11/12/84	98	29	27	114	2	Lynn Jahnke
11/17/84	99	17	27	114	38	Lynn Jahnke

95	SE 29	27	114	25
96	NE 32	27	114	9
97	NE 33	27	114	17
98	NE 34	27	114	50
99	SE 35	27	114	5
100	NWSW 36	27	114	15
101	SESW 36	27	114	20
102	NENW 36	27	114	20

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able 5. Groups of elk and number of elk observed within various distances of well 2-22 at the head of Graphite Hollow.

istance from well n miles	November 1-May 19 1979 - 1984			October 31-May 19 1984 - 1985			December 26-May 16 1985 - 1986			December 12-May 6 1986 - 1987		
	Groups	% of Total	Number Counted	Groups	% of Total	Number Counted	Groups	% of Total	Number Counted	Groups	% of Total	Number Counted
ess than 0.5 mile	11	14.5	389	0	0.0	0	3	8	183	0	0.0*	0
.5 to 1.0 mile	10	13.2	237	2	4.3	75	5	13	175	1	25.0	28
.0 to 1.5 mile	12	15.8	341	27	57.4	920	11	28	390	2	50.0	177
.5 to 2.0 mile	16	21.0	294	9	19.2	165	11	28	91	0	0.0	0
.0 to 2.5 mile	15	19.7	182	4	8.5	156	5	13	134	0	0.0	0
reater than 2.5 mile ithin Graphite and xcluding Hogsback	6	7.9	78	5	10.6	168	4	10	42	1	25.0	25
ogsback	6	7.9	37	0	0.0	0	0	0	0	0	0.0	0
OTALS	76	100.0	1,377	47	100.0	1,484	39	100.0	962	4	100.0	230

Table 6. Numbers of groups of elk and total elk counted within Graphite Hollow or Rock Creek crucial elk winter range.

Section	Township	Range	1979-1984		1984-1985		1985-1986		1986-1987	
			Groups	Elk Counted	Groups	Elk Counted	Groups	Elk Counted	Groups	Elk Counted
8	27	114	3	37	2	20	1	27	0	0
17	27	114	3	44	15	480	2	184	1	148
18	27	114	4	185	9	228	12	340	0	0 *
19	27	114	1	110	3	28	5	67	0	0
21	27	114	9	165	3	53	3	183	1	25
22	27	114	7	383	2	75	5	94	0	0
23	27	114	0	0	0	0	1	9	0	0
20	27	114	1	25	1	74	0	0	1	29
27	27	114	8	309	1	47	1	90	0	0
26	27	114	2	43	2	96	0	0	0	0
34	27	114	2	71	3	174	0	0	0	0
35	27	114	2	22	1	28	0	0	0	0
13	27	114	0	0	1	40	0	0	0	0
14	27	114	3	43	0	0	1	25	0	0
36	27	114	3	32	0	0	0	0	0	0
TOTALS			94	1288	43	1466	23	895	3	328

Table 7. Number of elk observed on winter aerial trend counts on Riley, Reed, and Trail Ridges from 1978-1987.

Year	Number of Elk	Location	Drilling Activity
Jan. 1978	75	Riley, Reed	None
Feb. 1981	80	Reed	1 well on Riley
Jan. 1982	7	Riley	3 wells on Riley
Jan. 1983	62	Riley	None
Jan. 1984	44	Riley	None
Mar. 1985	74	Riley	None
Mar. 1986	6*	Riley, Reed	None
Jan. 1987	59	North Mtn.	None
Jan. 1987	6	Riley	None
Feb. 1987	50	North Mtn.	None
Mar. 1987	37	Reed	None

* 61 elk were counted on May 1, 1986 on Riley and Reed Ridges.

Table 8. Number of elk observed on the Lake Ridge calving area from 1980 to 1987 as determined from ground and aerial reconnaissance.

Date	Location		Number of elk	Field Activity
6/17/80	Sec. 34,35	T28N, R114W	55	None
6/25/80	Sec. 3	T29N, R115W	100	None
7/09/80	Sec. 30	T29N, R114W	140	None
5/15/81	Sec.34	T28N, R114W		
	Sec.3,4,5,20	T28N, R114W	71	None
5/26/81	Sec. 5	T28N, R114W	46	None
7/10/82	NW 11	T28N, R115W	130	None
7/20/83	Sec. 19	T29N, R114W	78	None
7/28/83	Sec. 24	T29N, R114W	130	None
6/08/84	Sec. 34	T28N, R114W	13	Survey and road construction
6/10/84	Lake Ridge		8	Field development
6/13/84	Lake Ridge		7	Field development
6/19/85	Sec. 34	T28N, R114W	28	None
6/15/86	Sec. 34	T28N, R114W	3	Field development Manifold 9
6/29/86	Sec. 34	T28N, R114W	12	Field development Manifold 9
5/06/87	Sec. 16	T28N,R114W	6	None
	Sec. 21	T29N,R114W	14	None
	Sec. 29	T29N,R114W	3	None
	Sec. 33	T29N,R114W	9	None

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regulation setting firm maximum on hours worked.

Affirmed.

Labor Relations 🔑1069
States 🔑18.46

Federal Motor Carrier Act does not preempt state statute requiring employer to pay time and one half for work in excess of 40 hours per week, absent showing that state statute has same effect as regulation setting firm maximum on hours worked. 49 U.S.C.A. § 3101 et seq.; HRS § 387-3(a).

Barbara A. Petrus, Honolulu, Hawaii, for defendant-appellant.

Bruce W. Rodsen, Honolulu, Hawaii, for plaintiff-appellee.

Appeal from the United States District Court for the District of Hawaii.

Before BROWNING, Chief Judge, WRIGHT and LEAVY, Circuit Judges.

PER CURIAM:

Appellant Pony Express, a carrier regulated under the federal Motor Carrier Act, 49 U.S.C. § 3101 *et seq.*, argues that the Motor Carrier Act preempts Hawaii Revised Stat. § 387-3(a) requiring employers to pay time-and-one-half for work in excess of 40 hours per week.

Three circuits have considered this contention and have rejected it. *See Pettis Moving Co. v. Roberts*, 784 F.2d 439 (2nd Cir.1986); *Central Delivery Serv. v. Burch*, 486 F.2d 1399 (4th Cir.1973), *mem. aff'g* 355 F.Supp. 964 (D.Md.); *Williams v. W.M.A. Transit Co.*, 472 F.2d 1258 (D.C. Cir.1972). We agree for the reasons adequately stated in these opinions.

Pony Express offers only one new contention, arguing the federal and state statutes conflict because the "practical effect" of the Hawaii overtime pay law is to set the maximum number of hours at 40 per week, whereas Department of Transportation regulations generally provide for a maximum workweek of 60 hours. 49 C.F.R. § 395.3(b). Pony Express did not show that Hawaii's overtime pay statute has the same effect as a regulation setting a firm maximum on hours worked. One need not be an economist to realize that some employers may continue to provide more than 40 hours of work even though an overtime premium is required, because paying the premium may be cheaper than the alternatives of not providing service to customers or hiring more help.

AFFIRMED.

* * *

METHOW VALLEY CITIZENS COUNCIL, et al., Plaintiffs-Appellants,

v.

REGIONAL FORESTER, etc., et al., Defendants-Appellees.

No. 86-4168.

United States Court of Appeals, Ninth Circuit.

Argued and Submitted July 6, 1987.

Decided Dec. 1, 1987.

Citizens group brought action alleging violations of the National Forest Management Act, Clean Air Act, and National Environmental Policy Act, in connection with issuance of special use permit for development and operation of destination ski resort on national forest land. The United States District Court for the District of Oregon, William M. Dale, Jr., United States Magistrate, dismissed National Forest Management Act and Clean Air Act claims upon motions for summary judgment, and affirmed forest service's record of decision, and citizens group appealed. The Court of Appeals, Ferguson, Circuit Judge, held that environmental impact statement on proposal to designate portion of national forest land for use as ski resort was inadequate.

Reversed and remanded.

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1. Woods and Forests 🔑8

Although detailed supplemental regulations issued by forest service did not entirely remove decision to issue special use permit from agency discretion, they did impose specific obligations on issuing authority and were binding upon regional forester when deciding whether to grant special use permit for development of ski area in national forest, and thus, decision to issue special use permit was subject to judicial review. 5 U.S.C.A. § 701(a).

2. Woods and Forests 🔑8

Issuance of special use permit for development and operation of four seasons ski resort in national forest area was arbitrary, capricious, and abuse of discretion; federal regulation governing issuance of special use permit required existence of, among other things, adequate mitigation plan for damage to environment, and mitigation plan for ski project was vague and undeveloped.

3. Health and Environment 🔑25.15(10)

Findings of fact underlying lower court's decision on adequacy of environmental impact statement are reviewed for clear error.

4. Health and Environment 🔑25.10(8)

To be adequate, environmental impact statement must consider every reasonable alternative. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

5. Health and Environment 🔑25.10(8)

Need for legislative action to implement alternative to proposed action does not automatically justify excluding alternative from environmental impact statement. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

6. Health and Environment 🔑25.10(6.1)

Environmental impact statement for development and operation of destination ski resort on national forest land was inadequate, where no consideration was given to whether development of winter sports opportunities could be pursued at alternative sites. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

7. Health and Environment 🔑25.10(7)

To meet mandates of National Environmental Policy Act, environmental impact statement for proposed destination ski resort on national forest land was required to contain discussion and evaluation of reasonably foreseeable significant effects which would be proximately caused by implementation of proposed development and operation of resort. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

8. Health and Environment 🔑25.10(6)

If government agency has difficulty obtaining adequate information upon which to make reasoned assessment of environmental impacts of proposed action, agency may not simply negate existence of these impacts; rather, it has obligation to engage in what is called "worst-case" analysis. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

9. Health and Environment 🔑25.10(6.1)

Cursory discussion, in environmental impact statement for operation and development of ski resort on national forest land, of impacts of ski resort to mule deer herd was inadequate; discussion was based on incomplete information. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

10. Health and Environment 🔑25.10(6.1)

Discussion in environmental impact statement for development and operation of destination ski resort on national forest land, of air quality impact on wilderness area was inadequate, where discussion was based on estimate of difference in elevation between floor of valley where ski resort was to be developed and lowest portion of ridge separating valley from wilderness, and estimate was egregiously incorrect. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

11. Health and Environment 🔑25.6(3)

National Environmental Policy Act and statute authorizing forest service to issue special use permit for use of national forest land require analysis and development of air quality management program before permit application can be approved. 16 U.S.C.A. § 497; National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

12. Health and Environment 🔑25.10(6)

Environmental impact statement need not include assessment of how exhaustion of air quality degradation increment will limit opportunities for future commercial development. National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

13. Woods and Forests 🔑8

Provisions of code of federal regulations governing award of special use permit impose affirmative duty to develop necessary mitigation measures before permit is granted.

14. Health and Environment 🔑25.10(6.1)

Environmental impact statement for development and operation of destination ski resort on national forest land inadequately discussed measures for mitigation of possible adverse impacts on environment, were discussion was in very general terms, lacking both detailed descriptions of required and possible mitigation measures, and memorandum of understanding entered into with county and state agencies, offered no assurance that vague mitigation objectives would ever be achieved. 16 U.S.C.A. § 497; National Environmental Policy Act of 1969, § 102, 42 U.S.C.A. § 4332.

David A. Bricklin, Bricklin & Gendler, Seattle, Wash. (Molly Holt, Long Beach, Cal., on brief), for plaintiffs-appellants Methow Valley, Washington Environmental Council, and Sierra Club.

David C. Shilton, Dept. of Justice, Washington, D.C., for the federal appellees.

Glenn J. Amster, Hillis, Cairncross, Clark & Martin, Seattle, Wash., for defendant-appellee Methow Recreation, Inc.

Appeal from the United States District Court for the District of Oregon.

Before GOODWIN and FERGUSON, Circuit Judges, and STEPHENS,* District Judge.

FERGUSON, Circuit Judge:

Sandy Butte overlooks the Methow Valley, an unspoiled, sparsely populated area on the eastern side of the North Cascade Mountains in the State of Washington. The Methow Valley provides critical winter range and migration corridors for Washington's largest migratory deer herd. Sandy Butte is a 3,900-acre parcel in the Okanogan National Forest. The upper one-third of Sandy Butte is entirely roadless. In 1978 appellee Methow Recreation Inc. (MRI) applied for a "special use" permit to develop and operate a four-season destination ski resort on Sandy Butte and a large parcel of private land it had acquired adjacent to Sandy Butte. The proposed development is known as the Early Winters project. The project is expected to spawn extensive commercial and residential development in the Methow Valley.

Pursuant to requirements of the National Environmental Policy Act (NEPA), 42 U.S.C. § 4332, mandating completion of an Environmental Impact Statement (EIS) analyzing the environmental impacts of "major" governmental actions, the appellee Forest Service studied the question of whether it should allocate Sandy Butte for use as a downhill ski area. In 1982 the Forest Service published a draft EIS on a proposal to designate Sandy Butte for use as a major ski area capable of serving 8,200 skiers at one time (SAOT). The final EIS was issued in 1984. Based on its contents, in July 1984 the Regional Forester issued a "Record of Decision" which adopted a "future management plan" for Sandy Butte. The plan allocated the area for use as a ski area capable of serving 8,200 SAOT. The record of decision also approved the issuance of a special use permit to MRI for the Early Winters Project.[1]

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* Honorable Albert Lee Stephens, Jr., Senior United States District Judge, Central District of California, sitting by designation.

[1] A special use permit is necessary whenever a private party seeks to use lands owned by the federal government. The Forestry Service issues special use permits under authority derived from 16 U.S.C. § 497.

In December 1985, appellants Methow Valley Citizens Council, et al. (MVCC), brought this action in the District Court for the District of Oregon alleging violations of the National Forest Management Act, 16 U.S.C. §§ 1600–1614, the Clean Air Act, 42 U.S.C. §§ 7401–7626, and NEPA. Pursuant to local rule, the case was assigned to a United States Magistrate. The National Forest Management Act and Clean Air Act claims were dismissed upon motions for summary judgment and are not raised on appeal. The remaining NEPA issues were tried before the district court and the court affirmed the Forest Service's Record of Decision, dismissing the remaining claims. MVCC subsequently filed this appeal.

The issues facing this court are whether the district court erred in holding that the Regional Forester's decision to issue a special use permit is not reviewable and in its determination that the EIS adequately discussed alternatives to the proposed project, impacts to the deer herd, impacts on air quality, other significant impacts, and mitigation measures. Jurisdiction of this court is found under 28 U.S.C. § 1291.

I.

The Administrative Procedure Act, 5 U.S.C. §§ 701–706, governs judicial review of agency actions. Section 702 grants standing to challenge an agency action to anyone adversely affected by such action, except where the statute under which the action was taken precludes judicial review, or where the action is committed to agency discretion by law. 5 U.S.C. § 701(a). While there is no claim here that judicial review is barred by statutory preclusion, there is dispute as to whether the Regional Forester's issuance of a special use permit is an action committed to agency discretion such that it is removed entirely from the scrutiny of judicial review. The district court held that it was committed to agency discretion and not subject to judicial review.

The district court cited two cases—*Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 91 S.Ct. 814, 28 L.Ed.2d 136 (1971), and *Ness Investment Corp. v. United States Dept. of Agric., Forest Service*, 512 F.2d 706 (9th Cir.1975)—in support of its decision. In *Citizens to Preserve Overton Park*, the Supreme Court emphasized that action committed to agency discretion by law is "a very narrow exception ... applicable in those rare instances where 'statutes are drawn in such broad terms that in a given case there is no law to apply.'" 401 U.S. at 410, 91 S.Ct. at 820 (citation omitted). In *Ness*, this court held that the denial of a special use permit was not judicially reviewable because there was no "law to apply" by which the court could assess the legality of the agency's decision. The court held that neither the authorizing statute, 16 U.S.C. § 497, nor the very general language of corresponding regulations, 36 C.F.R. § 251.1 et seq., offered standards by which the agency's action could be tested. *Id.* at 715, 716. *Contra Sabin v. Butz*, 515 F.2d 1061, 1065 (10th Cir.1975). Thus central to our decision in *Ness* was the lack of formal guidelines for the issuance of special use permits.

[1, 2] The district court failed to note, however, that in 1980—prior to the commencement of activities relevant to this action—the Forest Service issued detailed supplemental regulations which, while not entirely removing the decision to issue a special use permit from agency discretion, do impose specific obligations on the authority considering issuance. See 36 C.F.R. §§ 251.54–251.56. These guidelines, binding upon the Regional Forester when deciding whether to grant MRI its special use permit for development of the Sandy Butte area, constitute sufficient "law" for this court to apply to confer jurisdiction over the matter. *See Wallace v. Christensen*, 802 F.2d 1539, 1556 (9th Cir.1986) (en banc) (Hall, J., concurring).[2] Thus we hold

that the Regional Forester's decision to issue a special use permit is subject to judicial review[3] where review involves an inquiry into whether the proper factors were considered by the Forestry Service. *See Save the Bay, Inc. v. Administrator of E.P.A.*, 556 F.2d 1282, 1295–96 (5th Cir.1977).[4]

II

The National Environmental Policy Act, codified at 42 U.S.C. § 4332, provides in relevant part that when an EIS must be prepared—whenever a major government action is proposed—it must include

> a detailed statement by the responsible official on—
>
> (i) the environmental impact of the proposed action,
>
> (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
>
> (iii) alternatives to the proposed action,
>
> (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
>
> (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(2)(C). Section 4332(2)(E) adds that all agencies of the Federal Government shall, to the fullest extent possible

> study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.

42 U.S.C. § 4332(2)(E).

There are two purposes served by preparation of an EIS. The statement should "provide decision-makers with an environmental disclosure sufficiently detailed to aid in the substantive decision whether to proceed with the project in light of its environmental consequences." *Trout Unlimited v. Morton*, 509 F.2d 1276, 1282 (9th Cir.1974), as well as "provide the public with information and an opportunity to participate in gathering information." *Citizens for A Better Henderson v. Hodel*, 768 F.2d 1051, 1056 (9th Cir.1985) (citations omitted).

An EIS aids the agency's own decision-making process by ensuring that the agency has before it "'all possible approaches to a particular project ... which would alter the environmental impact and the cost-benefit balance.'" *State of Alaska v. Andrus*, 580 F.2d 465, 474 (D.C.Cir.), *vacated in part sub nom. Western Oil & Gas v. Alaska*, 439 U.S. 922, 99 S.Ct. 303, 58 L.Ed.2d 315 (1978) (quoting *Calvert Cliffs' Coordinating Committee v. AEC*, 449 F.2d 1109, 1114 (D.C.Cir.1971)).

A.

[3] The findings of fact underlying a lower court's decision on the adequacy of an EIS are reviewed for clear error. *Northwest Indian Cemetery Protective Ass'n v. Peterson*, 795 F.2d 688, 696 (9th Cir.1986), *cert. granted*, — U.S. —, 107 S.Ct. 1971, 95 L.Ed.2d 812 (1987). "Interpretations of [environmental] regulations present questions of law, which are reviewable de novo." *Oregon Environmental Council v. Kunzman*, 817 F.2d 484, 493 (9th Cir.1987) (citing *Sierra Club v. Union Oil Co. of California*, 813 F.2d 1480, 1489 (9th Cir.1987)). "We review de novo the district court's determination of whether the EIS is reasonably thorough in discussing the significant aspects of the probable environmental impact of the proposed agency action." *Oregon Natural Resources Council v. Marsh*, 820 F.2d 1051, 1054 (9th Cir.1987) (citation omitted). This requires application of a "rule of reason" because a "reviewing court may not 'fly speck' an EIS and hold it insufficient on the basis of inconsequential, technical deficiencies." *Kunzman*, 817 F.2d at 492. In other words, "whether a particular deficiency, or combination of deficiencies in an EIS is sufficient to warrant holding it legally inadequate, or constitutes merely a 'fly speck,' is essentially a legal question, reviewable de novo." *Id.* at 496.

III

To explain the obligations set forth in section 4332, provisions in the Code of Federal Regulations address, inter alia, the discussion of alternatives[5] and the discussion of the foreseeable environmental consequences of these various alternatives[6] which must be included in an EIS. "The detail that NEPA requires in an EIS depends upon the nature and scope of the proposed action." *California v. Block*, 690 F.2d 753, 761 (9th Cir.1982).

A.

[4, 5] To be adequate, an environmental impact statement must consider every reasonable alternative. *Friends of Endangered Species v. Jantzen*, 760 F.2d 976, 988 (9th Cir.1985); *California v. Block*, 690 F.2d at 766–67; *Adler v. Lewis*, 675 F.2d 1085, 1097 (9th Cir.1982) ("this court has held the alternatives discussion to be subject to 'reasonableness.'"); *Save Lake Washington v. Frank*, 641 F.2d 1330, 1334 (9th Cir.1981); *Lange v. Brinegar*, 625 F.2d 812, 818 (9th Cir.1980) ("The discussion of alternatives in an E.I.S. statement is subject to a construction of reasonableness."). An EIS is rendered inadequate by the existence of a viable but unexamined alternative. *Citizens for a Better Henderson*, 768 F.2d at 1057 (citations omitted). Furthermore, even if an alternative requires "legislative action", this fact "does not automatically justify excluding it from an EIS." *City of Angoon v. Hodel*, 803 F.2d 1016, 1021 (9th Cir.1986) (footnote omitted), *cert. denied*, — U.S. —, 108 S.Ct. 197, 98 L.Ed.2d 148 (1987). Thus, the range of alternatives considered must be sufficient to permit a reasoned choice. *Life of the Land v. Brinegar*, 485 F.2d 460, 472 (9th Cir.1973), *cert. denied*, 416 U.S. 961, 94 S.Ct. 1979, 40 L.Ed.2d 312 (1974).

[6] Here the Forest Service's purpose—to provide a "winter sports opportunity"—is broadly framed in terms of service to the public benefit. It is not, *by its own terms*, tied to a specific parcel of land. *Compare City of Angoon*, 803 F.2d at 1021; *Trout Unlimited*, 509 F.2d at 1286. There appears no tenable reason for the Forest Service to be wedded exclusively to the development of Sandy Butte. Thus it should have appeared obvious that investigation was warranted to determine whether the development of winter sports opportunities could be pursued at alternative sites.[7]

Appellants have offered evidence suggesting that other sites may be well suited for the type of recreational development envisioned by the Forest Service. Unlike Sandy Butte, the sites discussed by the appellants are not adjacent to land owned by defendant MRI, but under the directive given to the Forest Service in its manual,[8] that fact does not preclude consideration of other reasonable alternatives. Moreover, since we find it reasonable to assume that expansion of existing ski areas would have less environmental impact than would the construction of an entirely new ski area,[9] while possibly achieving a comparable net increase in the total capacity of skiers served,[10] such alternatives might have been appropriate for investigation.

This court, however, would not require that the Forest Service explore an unreasonably broad range of alternatives. Rather, the range "need not extend beyond those [alternatives] reasonably related to the purposes of the project." *Trout Unlimited*, 509 F.2d at 1286 (citations omitted). Thus, the Forest Service should more clearly articulate its goal, specifically identifying the market and geographic pool of skiers targeted. This will provide a clear standard by which it can determine which alternatives are appropriate for investigation and consideration in its EIS. In its present state, the EIS's discussion of alternatives to the proposed action is inadequate as a matter of law.

B

[7] The district court held that the EIS adequately discussed the environmental impacts of the Early Winters project and its alternatives. We do not agree.

1.

The Magistrate's error resulted, in part, because he assumed that the law distinguished between primary and secondary impacts. Such a distinction would only confuse the issue. Rather, it is well established that NEPA and the Council on Environmental Quality guidelines require discussion of *all* significant impacts proximately caused by the proposed action—whether they, by convenience, are termed "primary" or "secondary". *See Coalition for Canyon Preservation v. Bowers*, 632 F.2d 774, 783 (9th Cir.1980) ("so-called 'secondary' impacts are often as significant as 'primary' effects."); *Trout Unlimited*, 509 F.2d at 1283 n. 9 ("The central focus should not be on a primary/secondary impact analysis but upon those impacts (either primary or secondary) which have a 'significant impact' upon the environment."); *see also Environmental Defense Fund, Inc. v. Hoffman*, 566 F.2d 1060, 1067 (8th Cir.1977).

This court would not require the government to speculate on impacts in order to "foresee the unforeseeable". *See City of*

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[2] In *Wallace v. Christensen*, Judge Hall correctly noted that:

> [t]he inquiry into whether there are regulations which a court may look to in reviewing an agency decision is a component of the section 701(a)(2) determination of whether a matter is committed to agency discretion by law. ... If there are no statutory or regulatory directives then a court may conclude that the agency action at issue falls into that narrow class of cases in which there is no law to apply.

802 F.2d at 1556 (Hall, J., concurring) (citations omitted).

[3] The magistrate stated that if he did have jurisdiction to review the Regional Forester's decision to issue the special use permit, then he believed that the decision was not arbitrary or capricious. However, an application for a special use permit must include "measures and plans for the protection and rehabilitation of the environment during construction, operation, maintenance, and termination of the project ...", 36 C.F.R. § 251.54(e)(4), and each special use authorization "shall contain ... [t]erms and conditions which will ... minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise [sic] protect the environment". 36 C.F.R. § 251.56(a)(1)(ii). Thus the Code of Federal Regulations specifically requires the existence of, among other things, an adequate mitigation plan. Since the mitigation "plan" here at issue is so vague and undeveloped as to be wholly inadequate, *see infra*, the Regional Forester's decision to grant the special use permit could be none other than arbitrary, capricious and an abuse of discretion.

[4] *Save the Bay* involved a challenge to the issuance of a permit pursuant to authority granted under the National Pollution Discharge Elimination System, 33 U.S.C. § 1342. The Fifth Circuit considered whether it had jurisdiction in light of the statute's broad language explaining that "[o]nce the relevant factors are before the agency, it can weigh them within [its] broad mandate with an expertise to which the restraining powers of judicial review could add little." 556 F.2d at 1295. Nevertheless, the court held that "[j]udicial review, however, can quite easily be effective to assure that all these factors receive the agency's attention." *Id.* at 1296.

[5] 40 C.F.R. § 1502.14.

[6] 40 C.F.R. § 1502.16.

[7] The Forest Service's final EIS listed four alternatives, including their preferred course of action, in addition to the alternative of "no action" mandated by statute. Yet all four of the "action" alternatives required development of Sandy Butte. No consideration was given in the EIS to ways of achieving the Forest Service's goal through other options, such as the expansion of existing downhill ski areas to other parts of Washington State.

[8] The manual provides in relevant part that:

> A permit shall not be granted simply to provide a commercial profit-making opportunity. The Forest Service is not required to accommodate ... desire of an individual applicant, a real public service or other justifications must be evident ... to show at least that the use meets a public need and will not conflict with National Forest objectives, programs or purposes.

Forest Service Manual § 2710.3.

[9] In *Coalition for Canyon Preservation v. Bowers*, 632 F.2d 774, 778 (9th Cir.1980), the defendants intended to construct a new four-lane highway which would pass through parkland in plaintiffs' town. The EIS was held to be deficient because it failed to consider the alternative of improving and widening a two-lane highway already in existence. This court stated that "the alternative ... was both reasonable and obvious, and that therefore the EIS is deficient. ... The use of a narrower than four-lane road is made even more obvious by the possibility that parkland would thereby [be] spared." *Id.* at 784 (citations omitted). *See California v. Block*, 690 F.2d 753, 767 (9th Cir.1982) ("In the absence of an alternative that looks to already developed areas for future resource extraction and use, the ... decisional process ends its inquiry at the beginning.").

[10] For example, one of the existing ski areas in Washington State has plans in motion to expand into a destination ski resort. A 1981 development report prepared for the Mission Ridge ski area details an extended expansion of the facility to accommodate an additional 3,900 SAOT, to make its total capacity 6,300 SAOT.

Davis v. Coleman, 521 F.2d 661, 676 (9th Cir.1975). However,

> [i]t must be remembered that the basic thrust of an agency's responsibilities under NEPA is to predict the environmental effects of proposed action before the action is taken and those effects fully known. Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as "crystal ball inquiry".

Id. at 676 (quoting *Scientists' Institute for Public Information v. A.E.C.*, 481 F.2d 1079, 1092 (D.C.Cir.1973)). Thus we find it imperative that the Forest Service evaluate the reasonably foreseeable significant effects which would be proximately caused by implementation of the proposed action. *Port of Astoria, Oregon v. Hodel*, 595 F.2d 467, 478 (9th Cir.1979) (EIS must address those reasonably likely consequences of a proposed development that would have an environmental impact).

2.

Plaintiffs argue that the development in the Methow Valley that is reasonably certain to follow development of Sandy Butte will cut off the deer herd's migration route, usurp fawning and staging areas and eliminate winter range—all of which are vital to the herd's survival. In contrast, the Forest Service believes that "with the implementation of mitigation measures" the impacts to the mule deer will be minor. This court fails to see the logic with which the Forest Service reaches this conclusion, since not only has the effectiveness of these mitigation measures not yet been assessed, but the mitigation measures themselves have yet to be developed.

Additionally, the Forest Service's own witness testified at trial as to the insufficiency of the data underlying the Service's conclusions in the EIS. He stated that the data was inadequate in terms of assessing the impacts of, for example, residential development reasonably certain to follow development of ski slopes on Sandy Butte.

The Forest Service is presently preparing a detailed and comprehensive study of the mule deer. However, just as the subsequent preparation of mitigation measures will not cure a deficient EIS, *see infra*, neither will a subsequent study providing information essential to assessment of the environmental impacts of a proposed action and its alternatives.

[8] If a government agency has difficulty obtaining adequate information upon which to make a reasoned assessment of the environmental impacts of a course of action, it may not simply negate the existence of those impacts. Rather, it has an obligation to engage in what is called a "worst-case" analysis.[11] This is because "NEPA requires a 'worst case analysis' when 'the information relevant to adverse impacts is essential . . . and is not known and the overall costs of obtaining it are exorbitant or . . . the information . . . is important and the means to obtain it are not known. . . .'" *Friends of Endangered Species*, 760 F.2d at 988 (quoting *Save our Ecosystems v. Clark*, 747 F.2d 1240, 1243 (9th Cir.1984)).

> The purpose of the analysis is to carry out NEPA's mandate for full disclosure to the public of the potential consequences of agency decisions, and to cause agencies to consider those potential consequences when acting on the basis of scientific uncertainties or gaps in available information. The analysis is formulated on the basis of available information, using reasonable projections of the worst possible consequences of a proposed action.

Save our Ecosystems, 747 F.2d at 1244–45 (quoting 46 Fed.Reg. 18032 (1981)); *see Oregon Natural Resources Council*, 820 F.2d at 1058.

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[11] The worst case analysis requirement was codified in 1979, 40 C.F.R. § 1502.22, and rescinded in 1986. This rescission, however, does not nullify the requirement, *Marsh*, 820 F.2d at 1058 n. 8, since the regulation was merely a codification of prior NEPA caselaw. *See Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark*, 720 F.2d 1475, 1478 (9th Cir.1983), *cert. denied*, 469 U.S. 1028, 105 S.Ct. 446, 83 L.Ed.2d 372 (1984); *see also Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1244 (9th Cir.1984).

[9] An absence of critical information renders it impossible for the Forest Service to make a reasoned decision in the disposition of a special use permit application. The EIS's cursory discussion of the impacts to the mule deer herd, based on incomplete information, is inadequate as a matter of law. If the Forest Service finds that the new comprehensive study of the mule deer still provides incomplete information, a worstcase analysis would be required for the areas in which information is lacking.[12]

3.

Appellants also contend that the district court erred in its assessment of the adequacy of the EIS's discussion of impacts on air quality.

a.

[10] The Pasayten Wilderness has been designated a "Class I" area by Congress. This means that its air is so unpolluted as to require heightened protection. Appellants believe that pollution in the Methow Valley proximately caused by the proposed development of Sandy Butte will significantly deteriorate their quality in the Pasayten Wilderness and that this was not revealed in the EIS. Appellees contend, and the district court held, that the EIS's discussion of air quality impacts to the Pasayten Wilderness is adequate. We disagree.

The EIS concluded that no Class I area would be impacted by the proposed action. In reaching this conclusion the government relied on data that was based upon an estimate of the difference in elevation between the floor of the Methow Valley and the lowest portion of the ridge separating the Methow Valley from the Pasayten Wilderness—an estimate that has since been shown to be egregiously incorrect. This error casts significant doubt on the assumption that the ridge forms a physical barrier that would prevent air pollution trapped beneath the inversion layer in Methow Valley from entering the wilderness area. Incorrect assumptions usually lead to incorrect conclusions. Thus the district court's conclusion, that the information relied upon by the government in preparation of the relevant section of the EIS was adequate, is clearly erroneous. The Forest Service must reassess the impacts upon the Pasayten Wilderness.

b.

[11, 12] Appellees acknowledge that without effective mitigation measures, the state standards for Total Suspended Particulates will be exceeded in nearly all of the areas of the upper Methow Valley as a result of foreseeable growth and development stimulated by the Early Winters project. This, presumably, is why the Regional Forester in his Record of Decision approving the special use permit application required that an air quality management program be developed. However, we interpret NEPA and section 497 as requiring this type of inquiry and analysis before a permit application can be approved.[13]

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[12] A district court has held that "[w]ithout accurate evidence of the effectiveness of . . . mitigation techniques, the Forest Service must prepare a worst case analysis." *Nat'l Wildlife Federation v. United States Forest Service*, 592 F.Supp. 931, 943 (D.Oreg.1984). This court expresses no opinion as to whether a worst case analysis is necessarily required in the absence of an evaluation of the effectiveness of mitigation measures. However, we do recognize the inherent limitation on a decisionmaker's ability to make a reasoned decision as to the environmental impacts of a proposed action where information contained in an EIS is incomplete or inaccurate.

[13] Appellants have made two additional arguments relating to air quality which merit discussion. First, they argue that the development of Sandy Butte and the growth it will spur will likely [illegible] the degradation increment available for this area under the federal Prevention of Significant Deterioration program. They suggest that the government is required to include in its EIS an assessment of how the exhaustion of the increment will limit opportunities for future commercial development in the Methow Valley. We disagree. "[A]lthough compliance [with federally established maximum threshold levels of pollution], growth management decisions were left by Congress for resolution by the states." *Alabama Power Co. v. Costle*, 636 F.2d 323, 364 (D.C.Cir.1979).

Second, appellants argue that the EIS is inadequate as a matter of law because it did not discuss the foreseeable significant carbon monoxide emissions from wood stoves. While the precise amount of air quality degradation that would result from these emissions is not entirely clear, given that even the highest estimate places the impact at well far below the applicable national standard, this omission is probably not sufficient to render the EIS inadequate. However, since a new EIS must be prepared, inclusion of an analysis of carbon monoxide emissions produced by wood stoves would assist the decisionmaker in making a fully informed decision.

c.

"Section 4332 of NEPA requires that 'action be taken to mitigate the adverse effects of major federal actions.'" *Stop H-3 Ass'n v. Brinegar*, 389 F.Supp. 1102, 1111 (D. Hawaii 1974), *rev'd on other grounds*, 533 F.2d 434 (9th Cir.), *cert. denied*, 429 U.S. 999, 97 S.Ct. 526, 50 L.Ed.2d 610 (1976). Thus an agency cannot decide to "act now and deal with the environmental consequences later." *North American Wild Sheep v. United States Dept. of Agric.*, 681 F.2d 1172, 1181 (9th Cir.1982). Consequently, an EIS must include a thorough discussion of measures to mitigate the adverse environmental impacts of a proposed action. *Oregon Natural Resources Council v. Marsh*, 820 F.2d 1051, 1065 (9th Cir.1987). "A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA." *Northwest Indian*, 795 F.2d at 697. "Moreover, the EIS must analyze the mitigation measures in detail and explain the effectiveness of the measures." 820 F.2d at 1065; *see Northwest Indian*, 795 F.2d at 697. And we note that the subsequent preparation of an elaborate mitigation plan "would not absolve a failure to prepare an adequate EIS." *Trout Unlimited*, 509 F.2d at 1284.

[13] Provisions of the Code of Federal Regulations governing the award of special use permits impose an affirmative duty on the appellee to develop the necessary mitigation measures before the permit is granted.[14] Similarly, the EIS must also contain a detailed explanation of the specific measures which will be employed to mitigate the adverse impacts of a proposed action. 40 C.F.R. §§ 1502.14(f), 1502.16(h).

[14] The Forest Service's EIS contains scattered pages in which they enumerate possible mitigation measures and identify mitigation goals that would be necessary to prevent excessive adverse impacts. These various discussions, however, are presented in very general terms, lacking both a detailed description of required or possible mitigation measures, and any analysis as to the effectiveness of these measures.

The Forest Service argues that further specificity as to the mitigation measures for on-site impacts can only be provided when the permittee presents a master plan of development. The Forest Service also maintains that they have satisfied the mitigation discussion requirement for another reason. In its EIS, there is a brief discussion of measures that *could* be required by local government to mitigate off-site impacts. Pursuant to this discussion, the Forest Service executed a Memorandum of Understanding (MOU) with Okanogan County, the Washington Department of Ecology, and the Environmental Protection Agency. In very general terms, the MOU identifies mitigation tasks and assigns responsibilities to various parties.

It is true that contractual obligations to insure the mitigation of adverse environmental consequences may not be a prerequisite to a statutorily adequate EIS. *Preservation Coalition, Inc. v. Pierce*, 667 F.2d 851, 860 (9th Cir.1982) (When efforts to mitigate the adverse environmental effects are "to be undertaken by third parties, their commitments, while they need not be contractual, must be more than mere vague statements of good intentions.") (citation omitted). However, the MOU offers no assurance whatsoever that the vague mitigation objectives it features—performance of almost all of which would be the responsibility of third parties to the permit process—would ever in fact be achieved or even that effective measures would ever be designed (let alone implemented), if the Early Winters development were to proceed. *Cf. Preservation Coalition*, 667 F.2d at 860 ("Since many of the 'mitigations' proposed by the agency were . . . potential actions to be taken by [third parties] reliance on them . . . was improper.") (footnote omitted).

As this court recently stated in *Oregon Natural Resources Council v. Marsh*,

> [t]he importance of the mitigation plan cannot be overestimated. It is a determinative factor in evaluating the adequacy of an environmental impact statement. Without a complete mitigation plan, the decisionmaker is unable to make an informed judgment as to the environmental impact of the project—one of the main purposes of an environmental impact statement.

820 F.2d at 1065 (citation omitted). The EIS's discussion of mitigation measures is inadequate as a matter of law.

IV.

The decision of the district court is reversed and remanded for entry of appropriate relief in accordance with this opinion.

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[14] The relevant section provides that

> Each special use authorization shall contain: (1) Terms and conditions which will . . . (ii) minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise [sic] protect the environment; . . . and (2) such terms and conditions as the authorized officer deems necessary to . . . (vi) require siting to cause least damage to the environment, taking into consideration feasibility and other relevant factors . . . .

36 C.F.R. § 251.56(a).

Bob D. WHITESIDE; Lenore E. Whiteside, Plaintiffs-Appellants,

v.

UNITED STATES of America, Defendant-Appellee.

No. 86-6064.

United States Court of Appeals, Ninth Circuit.

Argued and Submitted June 1, 1987.

Decided Dec. 1, 1987.

IRS levied against property, after it was sold pursuant to notice of default upon deed of trust. Secured parties who had purchased property brought action against IRS seeking declaration that federal tax lien was discharged by trustee's sale and that IRS levy was therefore wrongful. The United States District Court for the Central District of California, Consuelo Bland Marshall, J., granted summary judgment for IRS, and secured party purchasers appealed. The Court of Appeals, Kozinski, Circuit Judge, held that: (1) trustee's notice of sale to IRS, which held federal tax liens against property, was inadequate, as it omitted information about tax lien of one taxpayer property owner, but (2) that defect in notice was cured when no IRS objection was received by trustee five days before sale, and sale thus operated to extinguish Government's lien once sale was consummated.

Reversed and remanded.

1. Internal Revenue ⚷4986

Generally, lien in favor of the United States is not disturbed by nonjudicial sale of property, pursuant to the Internal Revenue Code. 26 U.S.C.A. § 7425(b).

2. Internal Revenue ⚷4986

Exception to general rule that lien in favor of the United States is not disturbed by nonjudicial sale of property exists if IRS is given notice of sale in accordance with IRS regulations, pursuant to the Internal Revenue Code. 26 U.S.C.A. § 7425(c)(1).

3. Internal Revenue ⚷4986

Trustee's notice of sale of property subject to deed of trust upon default was inadequate as to IRS, which had recorded federal tax liens against property; notice of sale omitted federal tax lien in name of one taxpayer property owner, although it disclosed tax lien in name of her husband, and IRS regulations require notice of sale to contain copy of each notice of federal tax lien affecting property to be sold. 26 U.S.C.A. § 7425(b), (c)(1).

4. Internal Revenue ⚷4986

IRS may not simply ignore inadequate notice of sale of property subject to deed of

20-A Tiering of environmental analyses is allowed for and encouraged by the Council on Environmental Quality (CEQ) regulations found at 40 CFR 1500.4(i), 1502.4(d), 1502.20, and 1508.28. These regulations allow agencies to sequence statements or analyses "From an environmental impact statement on a specific action at an early stage (such as need and site selection to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe" (43 CFR 1508.28).

BLM is in the process of making a leasing decision. Approval of mining operations will be addressed by the Office of Surface Mining Reclamation and Enforcement (OSMRE) and Colorado Mined Land Reclamation Division (CMLRD) at a later date. As a part of this leasing decision BLM must incorporate the requirements for Preference Right Lease Application (PRLA) processing found at 43 CFR 3430. In addition to reiterating environmental analysis standards contained in the CEQ's regulations, the PRLA regulations contain a list of specific topics to be addressed, and "provide for public review of the costs of environmental protection associated with the proposed mining of the preference right lease application area" (43 CFR 3430.4-3). As set forth in 3430.3-2 (c)(2), the EIS addresses the impacts to each of the numbered categories established in 3430.4-4, except that mine planning and bonding need not be addressed. Costs of mitigation, however, are not required and have not been included in the EIS. Rather, estimates of complying with the permitting, mining, and reclamation lease stipulations will be included in the cost estimate document as set forth in 3430.4-4 following completion of the EIS. The costing document is separate and distinct from the environmental analysis discussed in 43 CFR 3430.3-2. The costing document will be prepared following completion of the EIS. The costs of complying with the mitigation contained in the EIS, and permitting requirements will be considered in reaching a decision on commercial quantities.

The proposed mining scenario presented to BLM by the applicant represents what might reasonably occur, should the applicant meet commercial quantities requirements outlined in the PRLA regulations (43 CFR 3430). The scenario is based on the best information BLM has at this time. The mining scenario is, however, somewhat speculative at this time and may not resemble the scenario upon which the commercial quantities determination is based, or actual development. The level of available data, while adequate for a leasing decision, is insufficient for the permitting of mining operations. The analysis and constraints on development have been designed to be flexible to accommodate the permitting process, and changes in the proposed development that may be caused by market forces, or better data. It should be understood that the permitting process would have to be completed before any development could occur. The section in Chapter 1 entitled "Authorizing Actions and Agency Involvement" and Appendix B which contains a list of the "Laws and Agencies Mitigating Coal Related Impacts" have been presented to help inform the reader of this process, and the many mitigative requirements that would be applied during mine permitting. These requirements are included as part of the BLM's Preferred Alternative and will be considered in the cost estimate document. The laws outlined in Appendix B mitigating coal related impacts are part of BLM's Preferred Alternative.

The impact analysis in this EIS has been used to condition lease development where BLM felt that important resource values required protection above and beyond that provided for by the permitting process or where regulations provided for specific protection at this time. Examples include reclamation stipulations, and application of the unsuitability criteria respectively. Because of the specific requirements of the permitting process, and the generalities associated with the present mining scenario, performance standards rather than design criteria have been preferred for inclusion as potential lease stipulations.

Estimates to be presented in the costing document can reasonably be made based on the performance standards and industry practices. Basing of the costs on inaccurate and premature design criteria would be inflexible, provide a false sense of precision, and provide inaccurate results. If BLM were to confuse and mix the requirements of the various sections of the regulations and the leasing and permitting processes, it would constitute a disregard of statutory and regulatory mandates.

Because of the importance of the various steps in the PRLA leasing, and permitting processes, additional explanation of these processes has been included in Chapter 1 of this EIS.

20-1 "As explained in the preamble to the proposed rulemaking, no substantial changes were made in the Settlement Agreement after the proposal was submitted to the Department of Justice in November, 1985." (Federal Register Vol. 52, No. 130, 25794, Wednesday, July 8, 1987.) This draft EIS was prepared with the intent of complying with the terms of the Settlement Agreement which existed in draft form at that time. The regulations as published in the Federal Register on July 8, 1987, and found at 43 CFR 3430 fulfill the requirements of the Settlement Agreement and are part of a court judgement. Because the regulations are not substantialy different from the Settlement Agreement, and the EIS was prepared to comply with the Settlement Agreement, this EIS fulfills both the requirements of the Settlement Agreement and 43 CFR 3430 regulations.

The analysis found in the EIS is not invalidated because of the time between the publishing of the draft and the final EIS. There has not been substantial change in the proposed development, resource information in the PRLA area, or in the anticipated impacts.

20-2 The mining scenario presented in the document does not change. The PRLA probably would be developed in conjunction with one adjacent federal lease as identified in the draft and final EIS. Consol still holds this federal lease. The mining scenario, should the PRLA be leased, has not changed. Portions of the leases, which were held by Consol, were identified as mitigation/avoidance areas. These areas, while no longer avoidance areas, could still be used for mitigation contingent, as before, on agreements with the surface owners.

20-3 The great majority of the coal in the federal leases no longer held by Consol is not considered to be recoverable by surface mining methods. Northern Coal Company closed its underground mine in the vicinity and relinquished its federal leases. Given this history, the projected coal market, and the lack of immediately available rail facilities, development of two mines in the vicinity is not reasonably forseeable. The development of the PRLA and lease C-093713 continues to be the only reasonably foreseeable development, for purposes of this analysis, within this group of leases. The other leases were not proposed for development in the scenario presented in the draft EIS, except as mitigation. Coal recovery from those leases was never proposed nor analyzed. Total regional demand and subsequent production, as analyzed in the draft EIS remains unaffected. Therefore, there will not be any cumulative impacts to water quantity, air quality, and other resources.

20-4 As explained in the regulations found at 43 CFR 3430 "Non-competitive Leases; Detailed Procedures for Processing Preference Right Lease Applications for Coal", which are outlined in Chapter 1 of this EIS, the commercial quantities will occur separate from the EIS. A separate cost estimate document will be prepared and made available for public review. The discussion of PRLA processing and the EIS process has been expanded in the final EIS.

The change in lease holders should have no effect on the economic conditions surrounding development of the PRLA. While you are correct that to produce 10 million tons Consol would have to capture a large share of the market, as explained in the EIS, the actual development proposal remains unchanged. Because the economic context (demand and subsequent production) is based on the regional demand for Northwest Colorado, where coal under lease already exceeds demand and yet several companies are in production, the economic feasibility of this tract also remains unchanged.

Information on the present and projected coal production, and reasonably forseeable development levels in Northwest Colorado, has been included in the draft and final EIS.

The commentator also refers to the "mine plan area." No mine plan or permit application has been submitted by the applicant at this time. The development scenario presented by the applicant represents a conjecture based on the best available information, on the part of the applicant, as to how the parcel might ultimately be developed. In this instance it reflects the maximum development which may be forseeable. The applicant is not constrained by the production levels in the scenario presented here when preparing a final showing, or when submitting a permit application package.

20-5 Specific standards applicable to the permitting, mining, and reclamation of the James Creek site have been identified and examined in the EIS. Specific methodologies will appropriately be examined during the permitting process. The information and proposed stipulations contained in the Draft EIS are adequate for the purposes of 43 CFR 3430.3-2 "Environmental Analysis".

The cost estimate document will be prepared following preparation of the environmental analysis. (See 43 CFR 3430.4-3,4). The information in the EIS will be adequate for developing the required cost estimates, or cost ranges. The section quoted in this comment refers to the section of the regulations dealing with costing document and public review, not the section on environmental analysis.

20-6 The new regulations "provide for public review of the costs of environmental protection associated with the proposed mining on the preference right lease application area." 43 CFR 3430.4-3. This requires the preparation of a costing document separate from the environmental analysis. The costing document will be made available for public review.

20-7 This is one of the requirements that this EIS fulfills.

20-8 The EIS addresses the subject areas, surface and groundwater, air quality, vegetation, wildlife, etc. as required by this section of the regulations. (Subsidence which was eliminated from detailed study during the scoping process has been included in discussions in the final EIS.) These items and costs must be included in the costing document identified in 43 CFR 3430.4-3. Costing is not required in the environmental analysis (43 CFR 3430.3-2).

20-9 BLM, while preparing this EIS, did plan on the EIS and stipulations contained in it being used as a partial basis for calculating the costs associated with the final showing requirements. Permitting requirements will also be used as a basis for calculating costs. Taken together, the special stipulations presented in the EIS, and permitting requirements will be the basis for all environmental costs associated with processing of the PRLA. It was also anticipated that the costs associated with the commercial quantities determination might be open to public scrutiny. It was because of this that Chapter 1 contains a section entitled "Authorizing Actions and Agency Involvement", and that Appendix B, which contains a list of the "Laws and Agencies Mitigating Coal Related Impacts" has been included.

20-10 The EIS contains enough information that reasonable cost estimates as identified in 43 CFR 3430, can be made. The EIS does not need to contain the documentation of the costing analysis.

20-11 through 20-15
See the response to 20-1

20-16 and 20-17
The analysis contained in the EIS uses not only information from one year as provided by the applicant, but also draws on continuing data collection, and the data base and analysis of the Colorado Division of Wildlife. The text and maps have been modified to more clearly reflect this broad base of analysis.

20-18 The proposed stipulation has been rewritten to clearly require 100 percent in-kind mitigation of elk habitat.

20-19 Please refer to the response to 20-A. The regulations require the analysis of mitigating measures, either in the form of performance standards or design criteria, to mitigate impacts as appropriate. Cost of mitigation is not required in the EIS. Cost information is to be provided in a cost estimate document, which will be prepared following completion of the EIS.

20-20 The BLM has identified specific mitigation standards to ensure effectivness of the mitigation. It is not appropriate for the BLM to mandate a more costly mitigation method over a less costly one, that results in the same standard being achieved. While the BLM would require the standard be met, as a condition of the lease, the applicant would be free to choose the most cost effective method. The mitigation plan proposed by the applicant, and the specific mitigation proposed by BLM, explore methodologies to protect and restore elk habitat.

This environmental analysis is also separate from the costing analysis required by regulation. Please refer to response 20-A.

20-21 You are correct. Mining would cause hydrologic impacts as identified in the EIS

20-22 You are correct. BLM knows of no practical mitigation measures appropriate for inclusion as a lease stipulation. Based on present knowledge and analysis, some impacts to water resources would indeed be unavoidable.

20-23 BLM has proposed mitigation measures in this document which would lessen the impacts to surface water in the area. The information presented in the document has been included so that a reasonable cost estimate can be arrived at during the costing process. Because of the lack of definite information at this time, specifics are appropriately being deferred until the permitting process Also see the response to 20-22.

20-24 through 20-28
The potential stipulations have been modified to ensure clarity and enforceability. You are correct in stating that performance standards are relied upon at this time, rather than specific methodologies. Because BLM is contemplating a leasing rather than a permitting action, this approach to mitigation is appropriate.

20-29 Please refer to response 20-A.

20-30 Where resource values were considered particularly important, or compliance with existing permitting requirement vague, specific mitigation standards have been included as lease conditions, rather than permit requirements.

20-31 Thank you for attaching the material. The fundamental difference between the decision you cite and the action before BLM, is that no permit is being issued at this time. Because of confusion regarding PRLA processing, lease issuance, and mine permitting, a discussion of the processes has been added to Chapter 1 of the EIS.

Tiering of environmental analyses is allowed for and encouraged by the Council on Environmental Quality's Regulations (40 CFR 1500). Specifically, please refer to 40 CFR 1500.4(i), 1502.4(d). 1502.20, and 1508.28. These regulations clearly allow agencies to sequence statements or analyses:

"From an environmental impact statement on a specific action at an early stage (such as need and site selection to a supplement (which is preferred) or a subsequent statement or analysis at a later stage (such as environmental mitigation). Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe." (43 CFR 1508.28)

BLM is making leasing decisions at this time. Permitting of mining operations will be addressed by the Office of Mining Reclamation and Enforcement (OSMRE) and the Colorado Mined Land Reclamation Division (CMLRD) at a later date.

20-32 BLM does not feel there is a need to duplicate lengthy and detailed permitting requirements as lease stipulations.

20-33 See the response to 20-24.

20-34 Impacts to elk, not surface ownership are the focus of the wildlife analysis in the EIS. At the same time the ownership of about 2,250 acres of the surface estate by the Colorado Division of Wildlife (CDOW) is important. That is why the Summary (draft EIS) states on page V, third paragraph "About 85 percent of the PRLA surface estate is nonfederally owned. Of this, some 2,250 acres are part of part of the Jensen State Wildlife Area, owned by the Colorado Division of Wildlife." This statement was placed in the summary, along with discussions of CDOW involvement, to alert the public to this special ownership status. CDOW has been included in the analysis process as identified in the Summary, Chapter 2, and Chapter 4. A letter from the CDOW was also published on page 100 of the draft EIS. Additional references to CDOW have been added, along with CDOW maps, in the final EIS.

20-35 No provision is made in the regulations for declaring an area unsuitable solely because it is part of a state wildlife area. (See 43 CFR 3461). Consultation with the CDOW has resulted in stringent performance standards being required to mitigate wildlife impacts, as allowed for under 43 CFR 3461.1(o)(1).

20-36 The stipulation for elk habitat mitigation under BLM's preferred alternative has been changed to more clearly reflect BLM's intent, commitment, and analysis assumptions. As a condition of the lease, the applicant would be required to provide for 100 percent in kind habitat value replacement/enhancement. During the permitting process the applicant would have to demonstrate specifically how, where, and the ability to fulfill this requirement.

You are correct that at present Consol anticipates purchasing or leasing lands to fulfill this commitment. A review of lands and habitat values in the area by BLM and CDOW wildlife biologists indicates that sufficient lands are available in the vicinity of the project to meet this requirement. CDOW habitat mapping has been included in the final EIS.

Because replacement/enhancement would be a condition of the lease the applicant would not be allowed to proceed with surface disturbing activities prior to fulfilling this stipulation. The acquistion of surface rights for mitigation, prior to permit approval, would be the concern of the applicant.

20-37 See the response to 20-A.

20-38 The stipulations contained in Appendix C, not Consol's mitigation plan, are the basis for mitigation. The analysis identifies impacts to elk in the vicinity of, not just on, the disturbed area. Both direct and indirect impacts have been considered.

20-39 and 20-40
Differences in habitat values, use, and levels of mitigation that would be required invalidate a direct comparison of these two areas. Please refer to Appendix C for the stipulations that would be placed on the lease.

20-41 See the response to 20-36.

20-42 BLM has used updated wildlife data, and anticipates a lower level of cumulative development in northwest Colorado than previously thought. The analysis contained in this EIS presents a more realistic picture of what is presently occurring and anticipated to occur in the future, than was presented in the Green River-Hams Fork Coal Region Round Two Draft Environmental Impact Statement. See Chapter 2, Projected Development, and Chapter 3, Economic Assumptions.

20-43 through 20-47
Analyses by the Colorado Division of Wildlife and the BLM indicates there is enough land in the vicinity that can be used to compensate for habitat loss in the project area.

Data presented in the Wildlife analysis in Chapter 3 has been updated to reflect current information and the reliance on CDOW data. BLM has not and will not rely solely on information provided by the applicant, although information gathered through cooperative efforts has been incorporated.

Also see the response to 20-36.

20-48 The stipulations have been changed to reflect current ownership of adjacent leases. The intent of the proposed stipulations is to mitigate potential impacts, not simply preclude development. In this instance once reclamation has been achieved, and habitat values reestablished, mining (with mitigation) on adjacent lands would have been considered. However, since these leases have changed hands, stipulations on them are no longer appropriate.

20-49 BLM does not propose that this analysis is complete for all stages of leasing and mine development. A mitigation plan will be required during the permitting process.

Please see the response to 20-31.

20-50 through 20-52
See the response to 20-A. The appropriate cost of baseline studies is to be included in the cost estimate document.

20-53 You are correct. The alternatives have been addressed.

20-54 and 20-55
No requirement is presented in the regulations to examine these alternatives separately. Nowhere in the preamble to the new regulations is such a duty recognized, or consent given for such a requirement. It would be duplicative to examine these alternatives separately when impacts would be the same. This EIS addresses each of the numbered items contained in 43 CFR 3430.4-4 as required by 43 CFR 3430.3-2 (c)(2) as part of the EIS. A supposition that environmental protection costs are required, overlooks the intent and requirements of the regulations. Also please see the response to 20-A.

20-56 BLM believes that it is appropriate to group these alternatives to avoid duplication and redundancy. See the response to 20-54 and 20-55.

20-57 No tract has been identified for exchange at this time, so no impacts can be assessed. To state what impacts might occur as a result of exchanging the PRLA for an unspecified tract in a totally unknown location would be purely speculative, and misleading. Such an analysis has therefore not been included. As was stated on page 13 of the Draft EIS:

"If an exchange became desireable and the applicant and the Department agreed on a proposed tract for exchange, an appropriate environmental analysis of the impacts of leasing that tract would be prepared. Because no exchanges have yet been proposed for this PRLA, no analyses have been developed."

20-58 Economic differences between the alternatives cannot be predicted because of the unknown nature of the alternatives.

Also see the response to 20-57.

Economic costs to the applicant are appropriately addressed in the costing document, not the environmental analysis.

Also see the responses to 20-4.

20-59 through 20-67
Impacts of development of these two PRLAs would occur in different watersheds. The Jensen-Miller PRLA lies in the White River drainage, while anticipated development of this PRLA would occur in the Yampa River drainage. The James Creek EIS includes a cumulative analysis of all impacts from all reasonably forseeable development to which development of the PRLA would contribute. As discussed in Chapter 3, the only cumulative impacts of developing these leases were to hydrologic resources and local economic conditions. If total inflow exceeded the use of water in mining operations a National Pollutant Discharge Elimination System permit would be required for the discharge of mine effluent. Granting of this permit is appropriately part of the permitting process, and will be considered at a future date by the permitting agencies. (See the response to 20-A.)

The analysis in the EIS was prepared recognizing the restrive performance standards proposed by the company, and BLM.

20-68 To compensate for any contribution to cumulative on these fish species a special stipulation was included in the mitigation section.

20-69 You are correct that Section 7 consultation must be completed prior to approval of the mining plan. The Office of Surface Mining Reclamation and Enforcement will complete section 7 consultation during the permitting process. Please refer to the U. S. Fish and Wildlife Service letter in Chapter 4.

20-70 These concerns are not appropriate for analysis. They are not a part of the analysis required by the Council on Environmental Quality's regulations 40 CFR 1500, regulations contained at 43 CFR 3430 or part of the commercial quantities determination.

If and when the applicant is determined to be eligible for a lease (after the commercial quantities determination) and these factors are present, they will be addressed in a decision document.

20-71 Thank you for your comment, however, it is BLM's opinion that the EIS complies with the new regulations.

20-72 No significant change in the proposed development has occurred.

20-73 This EIS analyzes the impacts of leasing or not leasing the PRLA. Detailed information on permitting, mitigation methodologies, and reclamation techniques has appropriately been deferred to the permitting process. See the response to 20-A.

20-74 The EIS, to the extent possible and as required by regulation, has adequately considered various alternatives.

20-75 and 20-76
The EIS provides the specific mitigation or performance standards required by the rules. The costing process is a separate and distinct step in the process as outlined in 43 CFR 3430. The Council on Environmental Quality's regulations allow for the tiering of environmental analyses.

20-77 Cumulative impacts from all reasonably forseeable developments have been included.

20-78 Thank you for your comment.

21

colorado
environmental
coalition

Grant Street Suite 606
Denver Colorado 80203-3518 ● 837-8701

Greg Goodenow, Project Manager
Bureau of Land Management
455 Emerson St.
Craig, CO 81625

February 2, 1988

Dear Mr. Goodenow,

The following are comments of the Colorado Environmental Coalition related to the James Creek Coal PRLA EIS.

21-1 We have found that the EIS has failed to adequately address the new federal procedures for processing Preference Right Lease Applications. Since the public will not be able to comment on the major changes that need to occur in the EIS to make it adequate, either a new draft EIS or a supplement to the existing draft EIS needs to be prepared for public review.

21-2 The EIS has totally ignored the costing process now required so that environmental costs will be taken into account in the determination of whether a PRLA should even be let. There is a very costly mitigation plan for wildlife which may make the proposed mine uneconomical, especially since the cost of almost any new coal mine would be prohibitive under current economic conditions. The EIS is supposed to determine the validity of the PRLA by seeing if a mining operation is economically feasible. Thus, it would be appropriate that a benefit/cost analysis be included in the EIS to determine the economic feasibility of the proposed mine.

21-3 The EIS has failed to adequately apply the unsuitability criteria to the PRLA. Criterion 15 has not been applied properly to the PRLA. Much of the surface acreage of the PRLA is important wildlife habitat and is part of the Jensen State Wildlife Area. Even though some of the wildlife impacts can be mitigated, the mine will still have a devasting impact on wildlife. This criterion should be carefully reexamined.

21-4 The EIS also failed to examine all of the environmental impacts associated with the proposed mine site. Much of the analysis of environmental impacts was deferred to the mine permitting stage. Decisions deferred to the mine permitting stage include measures to reduce the impact to water resources and gathering data for aspen reclamation.

21-5 EIS has also failed to address cumulative impacts of coal development in the area. The James Creek Draft EIS totally ignores that the mine is being proposed in close proximity to one of the proposed mines in the Northwest Colorado Coal PRLA EIS. 21-5 cont.

21-6 Obviously, major flaws exist in the draft EIS that need to be rectified. Once again, we stress that either a supplemental draft EIS or a new draft EIS is necessary to comply with NEPA requirements. Please keep us informed on future developments related to PRLAs in the Craig District.

Sincerely yours,

Kirk Koepsel

Kirk Koepsel
Public Lands Coordinator

21-1 Thank you for your comment.

21-2 Please refer to response 20-A.

21-3 Please refer to response 20-35.

21-4 Please refer to response 20-A.

21-5 Please refer to response 20-59.

21-6 Thank you for your comment. You will be kept on our mailing list, and informed of decisions regarding PRLA processing.

REFERENCES

REFERENCES

ARMSTRONG, Harley and Clifton M. Wignall

1981 Cultural Resources Inventory Report on a Proposed Coal Drilling System in the Danforth Hills Area, Moffat and Rio Blanco Counties, Colorado, for W.R. Grace & Co. GRI/CRI Project No. 8125. Grand River Institute, Grand Junction, Colorado.

ATHEARN, Frederick

1976 An Isolated Empire, a History of Northwestern Colorado. Bureau of Land Management Cultural Resources Series No. 2. Denver, Colorado.

ARTHUR, Christopher S.

1977 Archaeological Reconnaissance of Proposed Coal Lease Areas in Moffat, Rio Blanco, and Routt Counties, Colorado. Reports of the Laboratory of Public Archaeology No. 1. Laboratory of Public Archaeology, Colorado State University, Fort Collins.

BABCOCK, Thomas F.

1982 Archaeological Survey of Thirteen Proposed Drill Locations for Consolidation Coal Company, Rio Blanco county, Colorado. ERC Report 8278. Grand River Consultants, Inc., Grand Junction, Colorado.

BAKER, Frederick S.

1925 Aspen in the Central Rocky Mountain Region. Department Bul. 1291. Washington, D.C., USDA.

BAKER, Steven G. and William G. Reed

1978 An Archaeological Reconnaissance of Some Access Road Alignments for Colorado-Ute Craig-Rifle 345 Kv Transmission Line, Phase II, Moffat, Rio Blanco, and Garfield Counties, Colorado. Centuries Research, Inc., Montrose, Colorado.

BAKER, Steven G. and Nancy E. Wood

1977 A Cultural Resource Inventory for the Rienau Mine #2, Northern Coal Company, Rio Blanco County, Colorado. Centuries Research, Inc., Montrose, Colorado.

BECKETT, Foster

1985 Oral Communication

BISHOP, M., K. Kelly, D. Kimball, G. Quinn

1982 Cumulative Hydrologic Assessment: Effects of Coal Mining on the Yampa River Basin, Moffat and Routt Counties, Colorado, KRT-81-031(R), Kaman Tempo, Denver, Colorado.

BROWN, John

1983 History of the Coal-Bearing Rocks of the Mesaverde Group in Northwest Colorado in Coal Development: Collected Papers, Vol. 1, pp. 217-237: Bureau of Land Management.

BROWNFIELD, Isabelle

1975b Report of Examination for Cultural Resources for USGS Exploration Drill Holes Y-1 thru Y-6, D-1 thru D-3. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1975c Report of Examination for Cultural Resources for Murphy Reservoir. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

BROWNFIELD, M. E. and E. A. Johnson

1980 Unpublished Report: USGS.

CAMP, DRESSER, AND McKEE, INC.

1984a Environmental Report Meeker PRLA and Adjacent Federal Leases for Consolidation Coal Company, Denver, Colorado.

1984b Meeker PRLA. Elk Mitigation Feasibility Assessment and Mitigation Plan, Denver, Colorado.

1985 Monitoring Study Report.

1984c Meeker PRLA. Elk Mitigation Study. Baseline Study Report, Denver, Colorado.

CASSELLS, E. Steve

1983 The Archaeology of Colorado. Johnson Publishing Company, Boulder, Colorado.

CHRISTENSEN, Diana

1984 Cultural Resource Investigations in the Danforth Hills Proposed Coal Lease Area, Moffat and Rio Blanco Counties, Colorado. Nickens and Associates, Montrose, Colorado.

COLORADO DEPARTMENT OF HEALTH

1978 Regulation for Implementation of the Colorado Salinity Standards Through the NPDES Permit Program, Water Quality Control Commission, Colorado Department of Health, Denver, Colorado.

1983 Classifications and Numeric Standards, Colorado River Basin, Water Quality Control Division, Colorado Department of Health, Denver, Colorado.

COLORADO DEPARTMENT OF HIGHWAYS

1980a Colorado Traffic Volume Study.

1980b Accidents and Rates on State Highways.

COLORADO DEPARTMENT OF REVENUE

1983 Annual Report

COLORADO DIVISION OF WATER RESOURCES

1984 Water Rights by Location for Districts 43 and 44, Colorado Division of Water Resources, Denver, Colorado.

1985 Colorado Division of Water Resources Office, Steamboat Springs, Colorado.

COLORADO DIVISION OF WILDLIFE

1978 Essential Habitat for Threatened or Endangered Wildlife in Colorado, CDOW Denver.

1985 Colorado Hunting Season Information, Denver, Colorado.

1985a Personal Communication with Jim Morris

COLORADO MINED LAND RECLAMATION DIVISION

1980 Regulations of the Colorado Mined Land Reclamation Board for Coal Mining, Colorado Department of Natural Resources, Denver, Colorado.

1984 Letter to Carol A. McDonald, Colorado Department of Natural Resource, Denver, Colorado.

COLORADO WEST AREA COUNCIL OF GOVERNMENTS

1979 Colorado West Area 208 Plan Final Main Report, Colorado West Area Council of Governments, Rifle, Colorado.

COLOWYO COAL COMPANY

1985-1984 Annual Report, Colowyo Coal Company (State Permit #C-019-81), Colowyo Coal Company, Meeker, Colorado.

COLTON, R. B., J. A. Holligan, P. E. Patterson, and L. W. Anderson

1975 Preliminary Map of Landslide Deposits, Craig 1° x 2° Quadrangle, Colorado. Scale 1:250,000, Map MF 700: USGS.

CONNER, Carl E.

1977b Archaeological Survey for White River Electric Axial-Colo-Wyo 69 KV Transmission Line. Antiquities Research Division, Historical Museum and Institute, Grand Junction, Colorado.

CREASMAN, Steven D.

1983e Report of Examination for Cultural Resources Inventory for the Proposed Texaco Wilson Creek No. 67 Well Location. Western Wyoming College, Rock Springs.

DAMES AND MOORE

1979 Coal Resource Occurrence and Coal Development Potential Maps of the Rattlesnake Mesa Quadrangel, Rio Blanco County, Colorado, Open File Report 79-1408: USGS.

1979 Coal Resource Potential Maps of the Ninemile Gap Quadrangle, Rio Blanco and Moffat Counties, Colorado, Open File Report 79-1405: USGS.

DEBYLE, Norbert V and Robert P. Winskur, eds.

1985 Aspen: Ecology and Management in the Western United States. USDA Forest Service, Rocky Mountain Forest and Range Exp. Station, General Tech. Report RM-119 Fort Collins, Colorado.

FISHER, Scott and Norbert V. Debyle

1983 The Soil Resource: Its Importance in the West and its Role in Coal Development and Reclamation, Coal Development Collected Paters, Volume II.

FRALISH, James S. and Orle L. Locks

1967 Prediction of Aspen Site Index from Correlation with Site Factors in Wisconsin. Forestry Research, Notes, University of Wisconsin.

GETTY OIL COMPANY and James S. Fralish

1985 Letter to Colorado Department of Health regarding NPDES Permit CO-0027154, Oak Creek, Colorado.

GORDON, E. Kinzie

1977 Letter Report on Cultural Resource Inventory for Proposed Tiger Oil Company Well Location Number 21-28 Federal and Three Access Road Corridors. Gordon and Kranzush Archaeological Consultants, Boulder, Colorado.

GORDON, E. Kinzie, Kris J. Kranzush, Laura M. Viola, and Donna J. Knox

1982 A Class II Cultural Inventory of the Lower White River and Danforth Hills Known Recoverable Coal Resource Areas (KRCRAs) Moffat and Rio Blanco Counties, Colorado. Cultural Resources Inventory Report Series No. 81-5. Gordon and Kranzush, Inc. Boulder, Colorado.

GRADY, James

1984 Northwest Colorado Prehistoric Context. Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver, Colorado.

GREER, John W.

1980 An Intensive Cultural Resource Survey of the ERG Federal Parkinson #5 Well Pad and Access, Moffat County, Colorado. Project Number AS-80-CO-9. Archeological Services, Laramie, Wyoming.

HAINES, D. V.

1975 Unpublished report: USGS.

HANSEN, Sheryl

1977a Report of Examination for Cultural Resources for Trespass Action Against Jensen. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1977j Report of Examination for Cultural Resources for Public Sale-Trespass Against Loper. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1977s Report of Examination for Cultural Resources for USGS Drilling Program 1977, 2 Coal Holes. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1977w Report of Examination for Cultural Resources for Tiger Oil Company Drill Pads 21-1 and 31-1, and Access Roads. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1978b Report of Examination for Cultural Resources for Energy Reserves Group Drill Location Well #37. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1981l Report of Examination for Cultural Resources for Thornburgh Mountain Fence for Grazing Allotments 4615 and 4618. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1978m Report of Examination for Cultural Resources for Civil Defense Communication Site. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1978p Report of Examination for Cultural Resources for USGS Drilling Program for 1978, Nine Exploration Cores for Coal Exploration. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1978s Report of Examination for Cultural Resources for Trail Upgrade by Sunmark Exploration. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1978u Report of Examination for Cultural Resources for Colorado-Ute Batch Site. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

1980m Report of Examination for Cultural Resources Survey for EMRIA Collum Gulch Reclamation Study Area. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

HARGIS, N. E. and Edward D. Redente

1984 Soil Handling for Surface Mines Reclamation, Journal of Soil Water Conservation

HARTLEY, John D.

1983a Report of Examination for Cultural Resources: Archaeological Survey for Consolidation Coal Company Danforth Hills Project Proposed 1984 Test Holes, Rio Blanco and Moffat Counties, Colorado. Grand River Consultants, Inc., Grand Junction, Colorado.

1983b Report of Examination for Cultural Resources: Archaeological Survey for Kourlis Ranch Oil Well T2N., R93W., Section 3, Rio Blanco County, Colorado, GRC Report 83101.

HEM, John D.

1970 Study and Interpretation of the Chemical Characteristics of Natural Water, USGS Water-Supply Paper 1473, Second Edition, U.S. Government Printing Office, Washington, D.C.

HENSS, Ruth A. and Jane L. Anderson

1979 A Cultural Resource Inventory of Several Lease Areas Around the Northern #1 Mine. Pioneer Archaeological Consultants. Longmont, Colorado.

HORVATH, Steven

1980 Report of Examination for Cultural Resources: Pittsburgh-Midway Drill Pad #F and Access Road Corridor for Gulf Mineral Resources. Centuries Research, Inc., Montrose, Colorado.

HOUNSLOW, Arthur and Joan Fitzpatrick

1978 Overburden Mineralogy as Related to Ground-Water Chemical Changes in Coal Strip Mining, Colorado School of Mines Research Institute, Golden, Colorado.

JENNINGS, Calvin H.

1978b Survey of Seven Core Hole Locations for Utah International, Inc. Laboratory of Public Archaeology, Colorado State University, Fort Collins, Colorado.

JENNINGS, Calvin H. and Kathleen Sullivan

1977 Archaeological Reconnaissance of the Craig-Rifle 345 Kv Electrical Transportation Line. Laboratory of Public Archaeology Cultural Resource Management Report 9, Colorado State University, Fort Collins, Colorado.

JOHNSON, Roger L.

1981a An Archaeological Survey of 135 Acres for the Colowyo Coal Company in Moffat County, Colorado. Western Cultural Resource Management, Inc., Boulder, Colorado.

1981b Identification of Sensitive Cultural Resources Within a Half-Mile Buffer Zone of the Colowyo Coal Mine in Moffat County, Colorado. Western Cultural Resource Management, Inc., Boulder, Colorado.

KAINER, Ronald E.

1983 A Class III Cultural Resource Inventory of the Utah International Inc. Danforth Hills Project Area, Moffat County, Colorado. Mariah Associates, Inc., Laramie, Wyoming.

KEESLING, Henry S.

1983k Report of Examination for Cultural Resources for BLM Road on Magnetic Mountain. Bureau of Land Management, Little Snake Resource Area, Craig, Colorado.

KNOX, Donna J.

1980 Report of Examination for Cultural Resources: Energy Resources Group #1, Federal Well Location. Gordon and Kranzush, Inc., Boulder, Colorado.

KRANZUSH, Kris J.

1980b Report of Examination for Cultural Resources for Mobil Drill Site, DR-2. Gordon and Kranzush, Inc., Boulder, Colorado.

1980c Reports of Examination for Cultural Resources for 12 Proposed Mobil Coal Holes in Danforth Hills #2 and #3 areas. Gordon and Kranzush, Inc., Boulder, Colorado.

1982 Final Report: Cultural Resources Inventory of the Utah International, Inc., 1982 Danforth Hills Drilling Program. Gordon and Kranzush, Inc., Boulder, Colorado.

LISCHKA, Joseph J.

1975 Cultural and Paleontological Resource Inventory and Evaluation of the Proposed W.R. Grace and Company Railroad Corridors and Colowyo Mine Sites, Moffat County, Colorado. Department of Anthropology, University of Colorado. Boulder, Colorado.

LUCAS, S. G. and A. J. Kihm.

1982 Paleontological Resources Study and Inventory of Part of the White River Resource Area and Vicinity, Piceance Creek Basin, Northwestern Colorado: ESCA-Tech Corporation for the Bureau of Land Management, Craig. Colorado.

LUOMA, Garry M. and Calvin H. Jennings

1980 Final Report on the Partial Archaeological Reconnaissance Survey of Utah-International 1979 Danforth Hills Drilling Project, Moffat County, Colorado. Reports of the Laboratory of Public Archaeology No. 39, Colorado State University.

MADISON, J. (District Wildlife Manager, CDOW, Meeker)

1984 Personal Communication with L. J. Brown of CDM, Inc., Denver, Colorado, July.

MARIAH ASSOCIATES, INC.

1983 Paleontological Evaluation of the Danforth Hills Project Area, Moffat County, Colorado, Laramie.

MAUTZ, W.M.

1978 Nutrition and Carrying Capacity in Big Game of North America: pp 321-348. J.L. Schmidt and D.L. Gilbert Eds. Wildl Manage Inst and Stackpole Books.

McKEAN, John R. and Kenneth C. Nobe

1981 Direct and Indirect Economic Effects of Hunting and Fishing in Colorado, Colorado Water Resources Research Institute, Colorado State University, Fort Collins, Colorado.

McKEAN, W.T. and B.O. Trindle

1976 Game Management Unit Inventory, Wildlife Management Unit 12 (Williams Forks). FED AID PROJ W-101-R-18 WPG, July Part l, P 113-203.

McWHORTER, D.B., J.W. Rowe, M.W. Van Liew, R.L. Chandler, R.K. Skogerboe, D.K. Sunada, G.V. Skogerboe, and Paul R. Nickens

1979 Surface and Subsurface Water Quality Hydrology in Surface Mined Watersheds, Part I. Text, Agricultural Engineering and Chemistry Departments, Colorado State Unitversity, Fort Collins, Colorado for EPA, Cincinnati, Ohio.

1982 Procedures for Predictive Analysis of Selected Hydrologic Impacts of Surface Mining, Colorado State University, Fort Collins, Colorado, for EPA.

MORGAN, M. D.

1969 Ecology of Aspen in Gunnison County, Colorado, Am. Mid. Nat., 82(1): 204-228.

MURIE, O. J.

1951 The Elk of North America. Wildlife Management Institute, Washington, D.C. and the Stackpole Books 698 pp.

NICKENS, Paul R.

1980 Report of Examination for Cultural Resources Survey for Access Road Between Magnetic Microwave Site and Road for Colorado-Ute Electric Association, Inc. Nickens and Associates, Montrose, Colorado.

NOISAT, Brad and Jane L. Anderson

1980 Final Report on the Archaeological Investigations at 5 RB 1237. Rio Blanco County, Colorado. Pioneer Archaeological Consultants, Longmont, Colorado.

NORDBY, Larry V. and Paul R. Nickens

1974 Peabody Coal, Seneca 2-W Strip Mine Submitted to Ecology Consultants, Inc., University of Colorado, Boulder.

OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

1983 Alluvial Valley Floor Identification and Study Guidelines, Office of Surface Mining Reclamation and Enforcement, U.S. Department of the Interior, Washington, D.C.

OFFICE OF THE FEDERAL REGISTER

1984 Code of Federal Regulations, Mineral Resources, 30 Parts 700 to End, Office of the Federal Register, National Archives and Records Service, General Services Administration, U.S. Government Printing Office, Washington, D.C.

1984 Code of Federal Regulations, Public Lands: Interior, 43 Parts 1000 to 3999, Office of the Federal Register, National Archives and Records Service, General Services Administration, U.S. Government Printing Office, Washington, D.C.

PARKER, Randolph S., and J. Michael Norris

1983 Simulated Effects of Anticipated Coal Mining on Dissolved Solids in Selected Tributaries of the Yampa River, Northwestern Colorado, USGS Water-Resources Investigations 83-4084, USGS, Lakewood, Colorado.

PEABODY COAL COMPANY

1985 Seneca II Mine Annual Hydrology Report, 1984, (State Permit No. C-005-80), Peabody Coal Company, Denver, Colorado.

PEDCo ENVIRONMENTAL, INC.

1981 Nomograph Method For Determining Impact on TSP Concentrations Resulting From Surface Coal Mining in Colorado. Prepared for the U.S. Bureau of Land Management under Contract No. YA-510-PHO-34. Kansas City, Missouri.

1981a Colorado's Climate, Meteorology and Air Quality. Prepared for U.S. Department of the Interior, Bureau of Land Management, under Contract No. YA-553-CTO-98, Cincinnati, Ohio.

1981b Nomograph Method For Determining Impact on TSP Concentrations Resulting From Surface Coal Mining in Colorado. Prepared for U.S. Department of the Interior, Bureau of Land Management, under Contract No. YA-510-PHO-34, Kansas City, Missouri.

PIONTKOWSKI, Michael

1980 The Utah International PRLA Coal Track (C-0123475) Class II Cultural Resource Inventory in Moffat County, Colorado. Bureau of Land Management, Craig District Office, Colorado.

PITTSBURGH AND MIDWAY COAL MINING COMPANY

1985 Edna Mine Hydrology and Wildlife Monitoring Report, 1984 (State Permit No. C-001-80), Pittsburgh and Midway Coal Mining Company, Oak Creek, Colorado.

RYAN, Robert P.

1978 Archaeological Clearance Survey of 32 Proposed Drill Sites and Adjoining Access Roads, Rio Blanco County, Colorado. Centuries Research, Inc., Montrose, Colorado.

STATE OF COLORADO

1983 Oil and Gas Statistics: Oil and Gas Conservation Commission.

SCHWARTZ, Cathy S. L

1979a Report of Examination for Cultural Resources: Tepee Park Fence. White River Resource Area, Bureau of Land Management, Meeker, Colorado.

1979b Report of Examination for Cultural Resources: Smith-Crawford Springs. White River Resource Area. Bureau of Land Management, Meeker, Colorado.

SCHWARTZ, Cathy S. and Priscilla E. Meacham

1980 Report of Examination for Cultural Resources: Class II Inventory of the Consolidation Coal Preference Right Lease Application C-0126998. White River Resource Area, Bureau of Land Management, Meeker, Colorado.

SHEPPARD, Wayne D. and Orville Engelby

1983 Rocky Mountain Aspen, Silvicultural Systems for the Major Forest Types of the United States, USDA, USFS, Agriculture Handbook No. 445.

SKOVLIN, J. M.

1982 Habitat Requirements and Their Evaluations. Elk of North America: Ecology and Management, Jack Ward, Thomans, and Dale E. Toweill, Eds. Wildlife Management Institute, and Stackpole Books, Harrisburg, Pennsylvania, pp 369-413.

STEELE, T. D., D. P. Bauer, D. A. Wentz, and J. W. Warner

1978 The Yampa River Basin, Colorado and Wyoming - A Preview to Expanded Coal - Resource Development and Its Impacts on Regional Water Resources, USGS Water - Resources Investigation 78-126, USGS, Water Resources Division, Lakewood, Colorado.

STEWART, Michael H.

1983 Hydrogology of The Upper Part of The Mesa Verda Group, Williams Fork Mountains, Routt and Moffat Counties, Colorado, Colorado School of Mines, Golden, Colorado.

TATE, Marcia J.

1980 Report of Examination for Cultural Resources: Archaeological Survey for Coguina Oil Corp. Kourlis Federal #1, Rio Blanco County, Powers Elevation, Denver, Colorado.

TEW, Ronald K.

1968 Properties of Soil Under Aspen and Herb-Shrub Cover. Res. Note INT-78, Ogden, Utah. USDA FS Intermountain Forest and Range Experiment Status.

THORNE, E. T., R. E. Dean, and W. G. Hepworth

1976 Nutrition During Gestation, in Relation to Successful Reproduction in Elk, J. Wildl. Manage. 40: 330-335.

TREAT, Patricia and Judith A. Newkirk

1981 A Class II Cultural Resources Investigation for the Proposed Craig to Rifle 230-Kv to 345-Kv Transmission Line Uprate, Northwest Colorado. Gilbert Commonwealth, Englewood, Colorado.

TWETO, Ogden

1979 Geologic Map of Colorado: USGS.

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

1982 Soil Survey of Rio Blanco County Area, Colorado.

U.S. DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS

1983 Farm Income and Expenditures, Washington, D.C.

U.S. DEPARTMENT OF THE INTERIOR

1976 Environmental Statement, Northwest Colorado Coal.

1976a Northwest Colorado Coal Regional Analysis Final EIS, Bureau of Land Management, Washington, D.C.

1976b EMRIA Report No. 23. Characterization Studies of Major Soils Found in Proposed Oil Shale and Coal Development Areas of Northwest Colorado.

1979 Consolidation Coal Company PRLA C-0126998 EA, Bureau of Land Management, Meeker, Colorado.

1980 Green River-Hams Fork Regional Coal Final EIS, Round One, Bureau of Land Management, Washington, D.C.

1981 Management Framework Plan Amendment, White River Resource Area, Colorado.

1983 Green River-Hams Fork Coal Region, Round Two, Draft EIS, Bureau of Land Management, Denver, Colorado.

1985 Field Reconnaisance, Craig, Colorado.

U.S. DEPARTMENT OF INTERIOR, GEOLOGICAL SURVEY

1966 Ninemile Gap Topographic Map, Scale 1:24,000, Denver, Colorado, USGS.

1972 Groundwater Occurrence in Northern and Central Parts of Western Colorado, Colorado Water Resources Circular 15, Colorado Water Conservation Board, Denver, Colorado.

1977 Water Resources Data, Colorado, Water Year 1976, Volume 3, USGS Water Date Report CO-77-3, USGS, Water Resources Division, Lakewood, Colorado.

1979 Water Resources Data, Colorado, Water Year 1978, Volume 3, USGS Water Data Report CO-78-3, USGS, Water Resources Division, Lakewood, Colorado.

1981 Water Resources Data, Colorado, Water Year 1980, Volume 3, USGS Water Data Report CO-80-3, USGS, Water Resources Division, Lakewood, Colorado.

1983 Water Resources Data, Colorado, Water Year 1982, Volume 3, USGS Water Data Report CO-82-3, USGS, Water Resources Division, Lakewood, Colorado.
U. S. ENVIRONMENTAL PROTECTION AGENCY

1976 Quality Criteria For Water, U. S. Environmental Protection Agency, Washinton, D.C.

VAN VOAST, Wayne A. and Robert B. Hedges

1975 Hydrologic Aspects of Existing and Proposed Strip Coal Mines Near Decker, Southeastern Montana Bulletin 97, Bureau of Mines and Geology, Butte, Montana.

VAN VOAST, Wayne A.

1982 Symposium on Surface Coal Mining and Reclamation in The Northern Great Plains, An Update on Mine Spoils Hydrology, Southeastern Montana, Montana Bureau of Mines and Geology, Billings, Montana.

VERME, L. J.

1969 Reproductive Patterns of White-Tailed Deer Related to Nutritional Plane. J. Wildl. Manage 33(4): 881-887.

WALSH, James P.

1984 Reconnaissance Alluvial Valley Floor Investigation, Danforth Hills Project, James P. Walsh and Associates, Inc., Boulder, Colorado.

WARNER, James W. and Robert H. Dale

1981 Digital - Transport Model Study of the Potential Effects of Coal-Resource Development on the

Groundwater System in the Yampa River Basin, Moffat and Routt Counties, Colorado, USGS Water-Resources Investigations 81-15, USGS Water Resources Division, Lakewood, Colorado.

WILLIAMS, Robert S. Jr.

1980 Percolation Effects on Spoil-Pile Hydrology, USGS, Water Resources Division Colorado District, Denver, Colorado.

1985 Personnel Communications, US Geological Survey, Lakewood, Colorado.

WITHERBEE, Kermit

1985 Oral Communication.

WOOLHISER, D. A., H R. Gardner and S. R. Olsen

1979 Evaluating Water Quality Effects of Surface Mining, USDA-SEA-AR, Fort Collins, Colorado.

DISTRIBUTION LIST

Federal Agencies

Advisory Council on Historic Preservation
Army Corps of Engineers
Department of Agriculture
  Forest Service
  Soil Conservation Service
Department of Energy
Department of Housing and Urban Development
Interstate Commerce Commission
Department of the Interior
  Bureau of Mines
  Bureau of Reclamation
  Fish and Wildlife Service (cooperating agency)
  Geological Survey
  National Park Service
  Office of Surface Mining Reclamation and Enforcement (cooperating agency)

State Agencies

Department of Natural Resources
Colorado Division of Wildlife
Colorado State Clearing House, Division of Local Government
Colorado State Historic Preservation Officer

Local Agencies

Associated Governments of Northwest Colorado
Moffat County Commissioners
Moffat County Planning Director
Northwest Colorado Council of Governments
Rio Blanco County Commissioners
Rio Blanco County Planner

Major Special Interest Groups

Colorado Environmental Coalition
Colorado Wildlife Federation
National Wildlife Federation
Sierra Club
Western Colorado Congress
Western Organization of Resource Councils

Other Organizations and Individuals

Numerous organizations and individuals expressing interest in the proposed action have been sent copies of this document.

ERRATA SHEET

**Table Number 3-8 should have appeared on page 3-15.
The table appears below.**

Name	*Location*	*Use*	*Amount (cfs)**
Kourlis Ranch Ditch #4	NE¼NW¼ sec. 19, T. 3 N., R. 92 W. (near study area)	irrigation, livestock	1.0
H Kourlis Ranch #18 Spr	NW¼NE¼ sec. 30, T. 3 N., R. 92 W. (near study area)	livestock	0.08
H.A. Bradford Spr. #1	SW¼SW¼ sec. 31, T. 3 N., R. 92 W. (near study area)	livestock	0.02
H.A. Bradford Spr. #2	NW¼SW¼ sec. 31, T. 3 N., R. 92 W. (near study area)	livestock	0.02
H Kourlis Ranch #17 Spr	SE¼SE¼ sec. 25, T. 3 N., R. 93 W. (near study area)	livestock	0.20
H Kourlis Ranch #12 Spr	NE¼SW¼ sec. 36, T. 3 N., R. 93 W. (near study area)	livestock	0.10
H Kourlis Ranch #13 Spr	NE¼SW¼ sec. 36, T. 3 N., R. 93 W. (in PRLA)	livestock	0.10

Source: Colorado Division of Water Resources 1984 and 1985

*cfs = cubic feet/second

Table 3-8 Little Creek Watershed-Adjudicated Water Rights Within and Near PRLA and Federal Lease C-093713

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